MILLING KINKS

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Milling Kinks

A COLLECTION OF INGENIOUS IDEAS FOR AIDING MILLERS AND MILLWRIGHTS

A Companion Volume to The "Book of Wrinkles"

FIRST EDITION

COMPILED FROM THE "AMERICAN MILLER"
BY
MITCHELL BROS. PUBLISHING COMPANY
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FOREWORD

"Milling Kinks" is the second volume issued in the series of "wrinkle" collections. Its pathway has been well-blazed by its predecessor and companion volume, the "Book of Wrinkles," which is familiar to milling readers all over the world. The latter book has run through four editions and the demand for it is still unabated. Its popularity is due to the utility of the ideas contained in it, the method of classifying them, and also that up to the present time there has been no similar book in existence.

These "wrinkles" are scattered through the pages of the "American Miller," over a period of many years. That millers appreciate being able to preserve them in permanent form is evidenced by the vast number of letters sent to the publishers asking when the next volume in the series would be ready. "Milling Kinks" is in reality that rarity in modern times—a book "published by popular demand."

As was the case with the "Book of Wrinkles," the compilation of "Milling Kinks" has leaned toward the simple but effective devices rather than the more complicated ideas which would necessitate special tools or machine shop equipment. By no means is it claimed that all of the contrivances in "Milling Kinks" are new or that they can be adapted in every mill working under different conditions. But it is believed that every miller can utilize some helps from among the number which are presented.

The publishers wish to pay a deserved tribute to the fertile genius of operative millers. These devices are all "brain-children" of the resourceful minds of "American Miller" readers. The publishers have merely gathered up a few of the many thousands of helpful hints published in the "American Miller" and put them in book form. To the originators belongs the real credit for "Milling Kinks."

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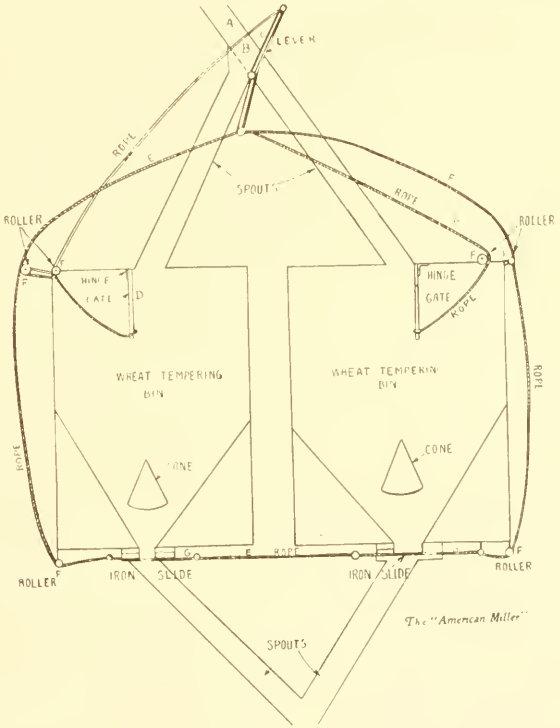
Milling Kinks

CHAPTER I

BINS, HOPPERS AND SINKS

AUTOMATIC SWITCH FOR TEMPERING BINS

A handy arrangement for automatically switching wheat from one tempering bin to another, at the same time opening or shutting the outlets in the two bins, is shown in the sketch. *A* is wheat spout, *B* a valve in spout and *C* a lever controlling the valve. *D* is



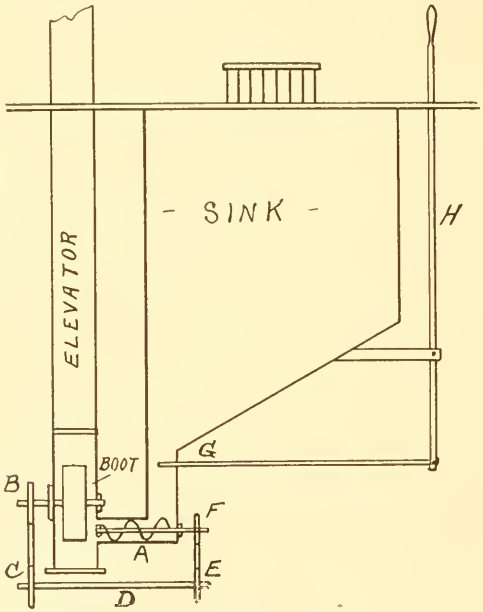
a swinging door or gate which hangs down in each bin. Ropes *E-E* running over rollers or pulleys *F*, are fastened to the hinged gates, the valve levers and also the slides *G-G* at the bottom of the bins.

When one bin gets full of wheat, the door is forced over, which pulls the rope. The rope causes the valve *B* to close, shutting off

the wheat in the spout leading to the full bin and opening the spout to the other bin. At the same time the slide under the full bin is opened, releasing the wheat. Thus it will be seen that when the mill is grinding wheat from one bin, the other bin is filling. When in operation the slides under the bins are set opposite to the way they are shown in sketch.

FEEDER FOR WHEAT SINK

The little device shown in the accompanying drawing will save many unpleasant trips to the bottom of the wheat sink to clean out the dust that accumulates there, and insure an even and constant feed to the separator. The conveyor box *A* should be made of



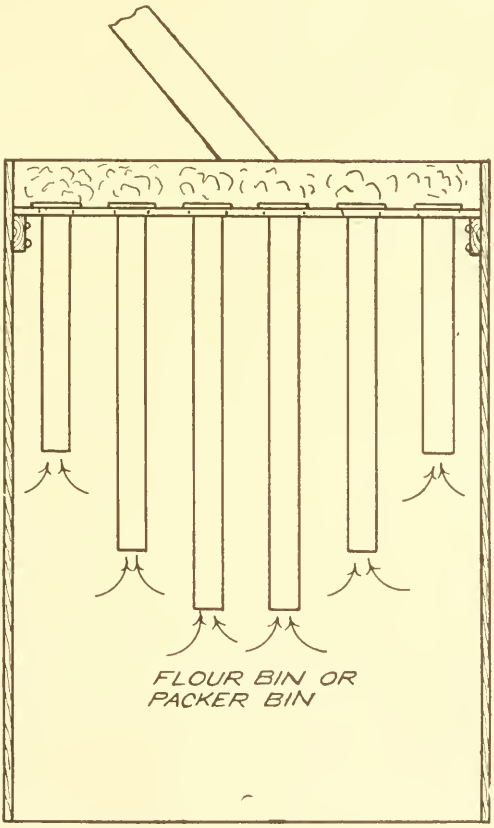
1½-inch boards, and the conveyor may be of any length from 12 inches up, as the situation may require, and from 2 to 4 inches in diameter. In this particular instance the barrel of a 2-inch auger is utilized for a conveyor, and the shaft extension to pulley *F* is a piece of ½-inch pipe shrunk on the stem of the auger. This feeder can easily be driven from the boot shaft of the elevator by means of the pulleys *B*, *C*, *E*, and *F*, and the countershaft *D*.

The cut-off slide *G* is pivoted and operated from the floor by the

lever *H*. The cover of the conveyor box might be made removable to remove straws and strings, though trouble of this kind rarely occurs.

TO STOP FLOUR BLOWING OUT OF PACKER BIN

One "invisible loss" in milling comes from the blowing out of flour from the flour chests and packer bins. Take a 1x6 board and saw holes through it about 12 or 15 inches apart, then place 2-inch



tin pipes in the holes. Have the pipes of different lengths, the longer ones in the center.

Attach the board, with pipes in, across the center of the bin by fastening cleats to the side wall of the bin as indicated. The holes should be large enough to allow the pipes to swing in any direction, with a rounding flange sufficiently large to form a universal bearing.

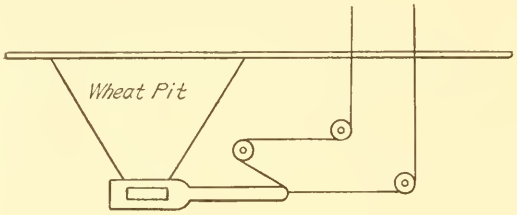
and the inner edges of the holes rounded to conform to the flange, as indicated by the sketch.

With this freedom to swing, the pipes will give when a slide of flour comes against them, and this not only prevents them from being bent or mashed, but makes sure that the end will follow the air space. This will allow the air to pass up and out at the top, which should be about 8 or 10 inches from the top of the bin.

It is best to have the pipes larger at the bottom and gradually taper, so that any flour that might be forced into them when the onrush comes will drop out when the lower end is free again.

TO RELIEVE CHOKING WHEAT PIT

At times a wheat pit has a tendency to choke as is well known. To remedy this put in small pulleys and ropes attached to the sill



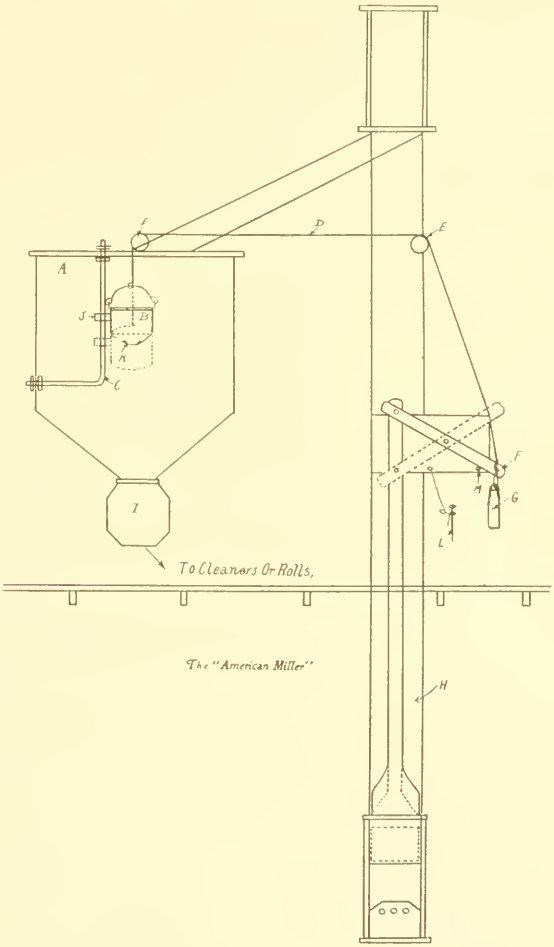
under the bin, as shown in the accompanying illustration, and lead the ropes to a point, where they can be worked while taking in wheat.

AUTOMATIC DEVICE FOR REGULATING FLOW OF WHEAT

In the sketch *A* is the bin for grain, 3x3x4 feet, 30-bushel capacity enough for 500-barrel mill. *B* is small round-bottom fire bucket with 2-inch hole in bottom. *C* is ¾-inch rod to keep bucket in place. *D* is ¼-inch rope connecting bucket with lever *F*. *E* represents pulleys for ¼-inch rope, while *F* is lever connecting with slide to regulate wheat. *G* is weight to pull bucket back in place and at same time raise slide to let grain in elevator. *H* is slide regulating grain to elevator. *I* is automatic scale to rolls, etc. *J* is ear or loop riveted to bucket for rod to pass through. *K* is 2-inch hole to let grain out of bucket. *L* is pin to hold slide down when grain is shut off, and *M* is pin inserted in hole under lever to act as a rest, also to regulate flow of grain.

The inlet slide is set so there will be more wheat elevated to bin

than amount taken away. As the bin fills up the bucket is filled. There is a downward pull as the wheat leaves the bin, drawing the bucket down and at the same time closing the wheat slide, shutting



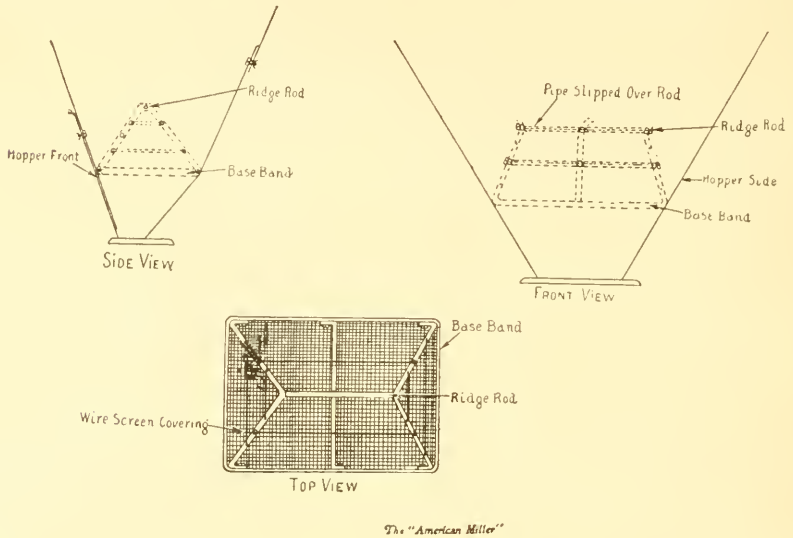
off wheat. As the wheat gets lower than the bottom of bucket, the wheat in bucket passes out through 2-inch hole in bottom. The weight on lever pulls bucket back in place and also raises slide, letting wheat into elevator.

When the operator wishes to shut off wheat, all he has to do is raise slide handle and put pin over top of slide. When starting wheat

all that is necessary is to pull out pin and the automatic device does the rest, working with almost human intelligence. The sketch shows a two-story plan, but the arrangement can be adapted to work several stories.

GRAIN HOPPER SCREEN

This screen must be designed to fit the particular unloading hopper and its base made from 1 inch by 3-16 inch band iron must be so measured as to fit snugly about two-thirds down into the hopper.



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From the middle point of each long side of this base bands of similar dimension are extended upright on edge, making an angle of about 60 degrees with the plane of the base, so that they intersect about as far above the base as the width of the frame.

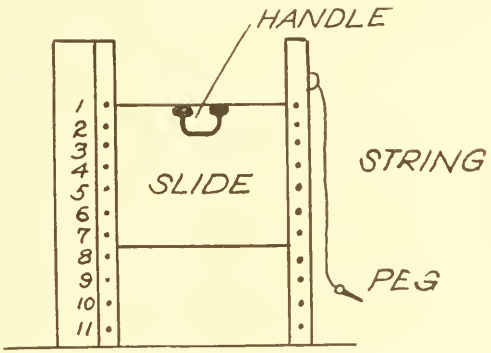
Through this intersection and at right angles to the bands that form it runs a ⅜-inch rod parallel to the long way of the hopper and half the length of the base, extending equally on either side of the intersection point. The ends of this rod are joined by riveted bands to the four corners of the base. This rod is now covered with two sections of ½-inch pipe slipped over it, and with thread and nut on each end drawn up tight so that the framework is rigid. Similar ⅜-inch rods can now be placed through the inclined brace bands at levels of 6 to 8 inches above each other as needed to strengthen the framework, according to the size of the hopper.

The entire frame is then covered with heavy wire screen of ¾-inch to 1-inch mesh, which can be clinched over on the edges and tire-tied to the frame rods in the middle.

The advantage of this pyramid-shaped screen is that it will never clog like the ordinary flat screen (because of the shearing motion against the oblique surface), but gives a constant steady flow of grain, preventing chokes on the receiving separator.

IMPROVED SLIDE FOR GRAIN BIN

The illustration shows an improved slide for a grain bin. In making this slide the strips on the sides are made a little wider than common, with the groove somewhat deeper than usual. Small holes



are bored close together through the strips and slide to permit regulating the opening under the slide with the peg.

In this way unvarying quantities can be drawn from each of the different bins for blending. With this arrangement the assistant miller can always see what percentage of each grade of wheat to draw to give the proper blending and thus keep the mill in unchanged grinding.

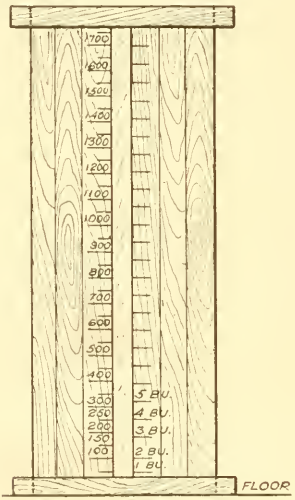
IMPROVEMENT IN STOCK HOPPERS

The accompanying illustration is a very valuable improvement in stock hoppers. The bin should be constructed of ⅞-inch or ¾-inch ceiling of 4-inch widths, placed vertically, should measure exactly 21½ inches by 25 inches inside and can be from 6 to 8 feet high, but not so high that the pressure of the wheat within will cause the sides to bulge.

Binders of the usual sort should be placed at the top and bottom. Then on the side of the bin which is next to the best light one of

the 4-inch pieces of ceiling is left out entirely for the full height of the bin. In each side of the opening thus left a groove is provided and into this groove clear glass is inserted. The glass should fit neatly and not be too loose. Then when completed, with the glass in place, not only the amount but the condition of the stock is plainly evident at all times. In this way the general or average condition of the wheat can be ascertained much more perfectly than by examination in the hand or under a glass, for a column of wheat six feet high, more or less, can be taken in at a glance.

In view of the fact that the glass is so narrow it is easily possible to get two strips of plate glass at small expense, and if the ends are



carefully squared the joint will hardly be noticeable, and the two will look like a continuous solid piece from top to bottom.

Next take a straight edge and lay off light pencil marks, vertically, one on each side of the glass opening and 3 inches from the edge of the wood. These are grinding lines only. Then on the right-hand side with a try square lay off horizontal lines 3 inches long, commencing 4 inches from the floor, and every 4 inches clear to the top.

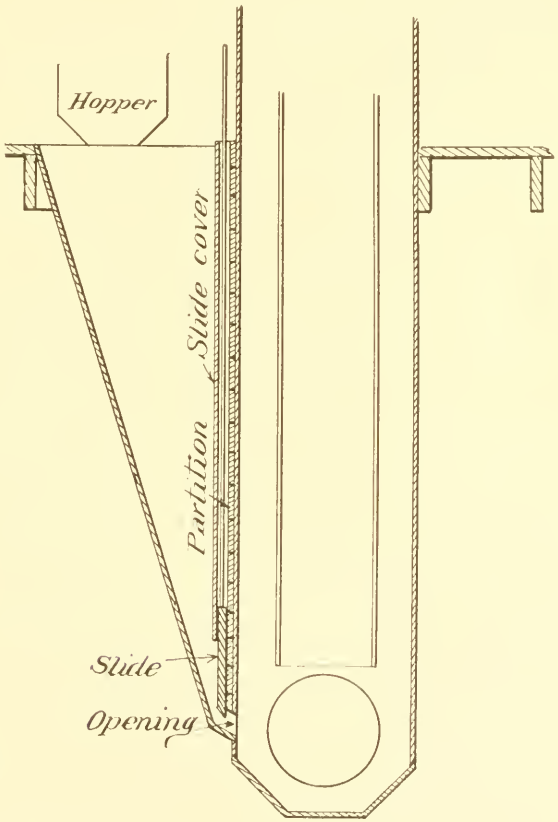
Cut in these lines carefully and deeply so that a sharp lead pencil can afterwards be run in them to bring the line out distinctly. Each 4-inch space will contain 2,150 cubic inches which is near enough to a bushel for all practical purposes.

On the left side of the glass similar lines may be placed to indicate

the number of pounds. If the lines are placed 6.70 inches apart each space will indicate 100 pounds of wheat, and the spaces may be further subdivided to suit the convenience of the individual. The pounds and bushels should be neatly stamped above each line and the entire chest can then be varnished to bring out the figures clearly.

SLIDE FOR GRAIN PIT

The sketch shows how a slide in a grain pit may be covered so the grain can not come in contact with it and weigh it down. Take,



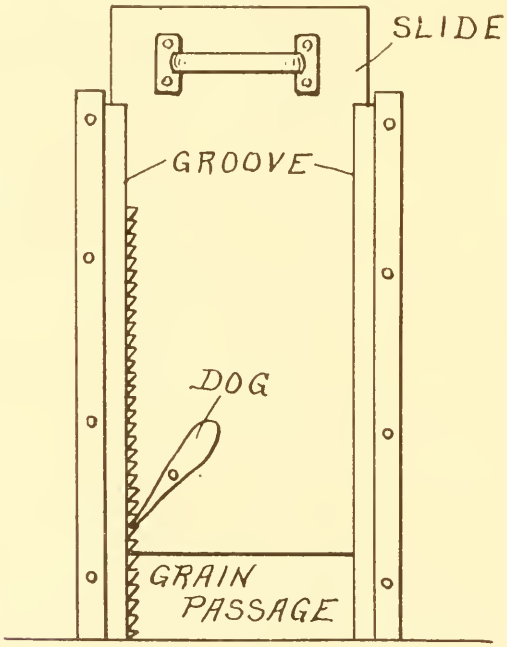
for instance, a pit 8 or 10 feet deep filled with grain. It will be seen that to raise the slide lever will require a hard lift and then it will be hard to keep it there. When the grain contains trash the slide will have to be raised and lowered frequently and at times the load is so

heavy that it requires the services of two men to do the work.

It will be seen that the millwright, instead of placing the slide handle or lever outside of the bin where the grain could not weigh it down, placed it inside of the bin, with the result as stated. If the handle that attaches to the slide is inside of the grain pit, box it up so it will work easily.

GRAIN BIN GATE

The illustration shows a grain bin gate which operates in grooves and can be set at any height desired, the dog holding it in place



wherever set. It enables the miller to get a uniform feed from two or more bins in blending the wheat for grinding.

The gate should be made from heavy plate steel or heavy galvanized iron. Thus constructed it is lighter than if made of wood and will not wear off at the bottom from contact with the wheat passing through.

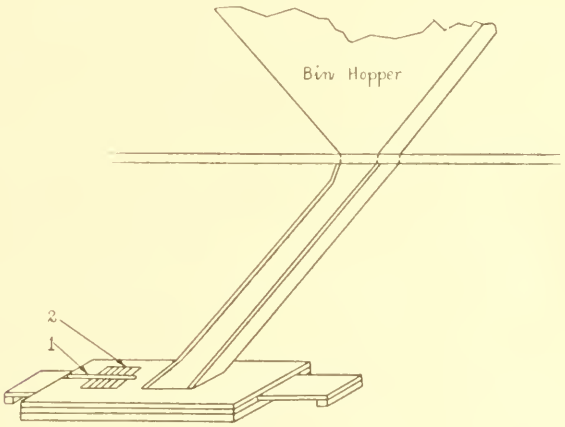
CHAPTER II

VALVES AND SPOUTING

GRADUATED SLIDE

The illustration shows a slide design for use where spout discharges to conveyor and it is desirable to carry spout full of grain or other stocks and one cannot make use of hand hole for examining volume.

The cap of slide has a slot, No. 1, cut required length, then at No. 2 a duplicate pattern of spout hole is marked off and graduated.



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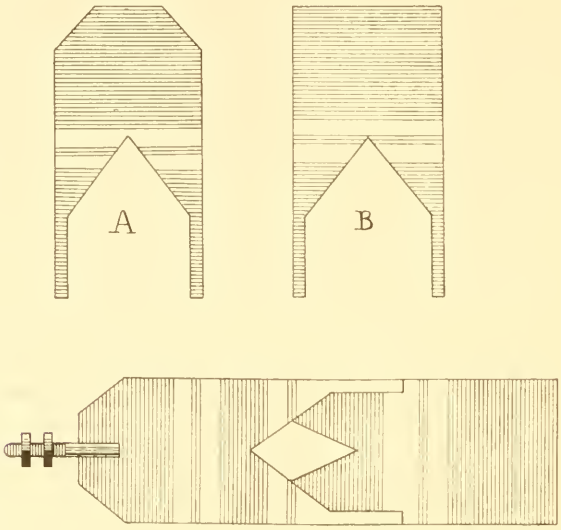
Insert a screw in slide proper that will allow it free travel in slot with movement of slide at a point where the stock is cut off and graduated markings extreme end. This will show the distance the slide is opened in discharging of grain.

FEEDING GRAIN WITH A SLIDE

It is often desirable to feed grain from a bin or into a machine by means of a slide. A slide that is cut square on the end which the material passes through causes more or less trouble from being stopped up with foreign matter that may be in the grain. By means of two slides cut on one end in shape of the letter V, and one working directly on top of the other, the trouble often experienced by

having slides choke, etc., is greatly lessened. By moving one slide so as to open or close the hole as desired this arrangement is both convenient and reliable.

An even better way to control the flow with the double slide is to fasten a threaded rod to one slide. The rod passes through a ring



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or other stationary part on each side of which is a nut. When the opening is at the proper place, the nuts can be turned against the stationary part from both sides, holding the slides in place and delivering an even flow without fear of choking.

HANDY SPOUT ARRANGEMENT

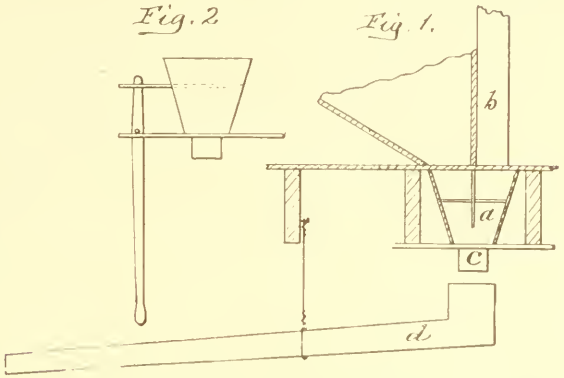
The sketch shows a handy spout arrangement used in connection with weighing wheat through the hopper scales for grinding. In Fig. 1, *a* is a double stub spout, one side of which receives the wheat from a flat-bottomed bin directly above. The other side receives wheat through the spout *b* from the second floor.

The double stub spout is supported by a board fastened to the joists of each side of the spout. The board has a circular opening and a piece of stovepipe iron nailed in, as shown in *c*.

The stub spout is fitted with two slides and levers, as shown in Fig. 2, the levers extending down to where they can be reached handily. The tin spout *d*, is fastened to a joist with a wire. The wire is

fastened to the spout at some distance from the top end, so that by raising the bottom end the spout is released from the inlet *c* and the bottom end can be hung up out of the way.

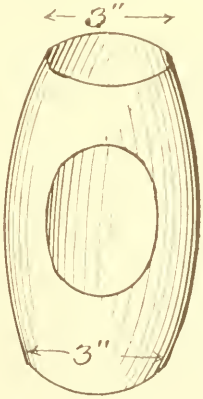
In this way a minimum amount of spouting is used in bringing



wheat from two separate floors. The spouting is always out of the way except when in use and is also very handy to operate.

SPOUT FOR HAND HOLE

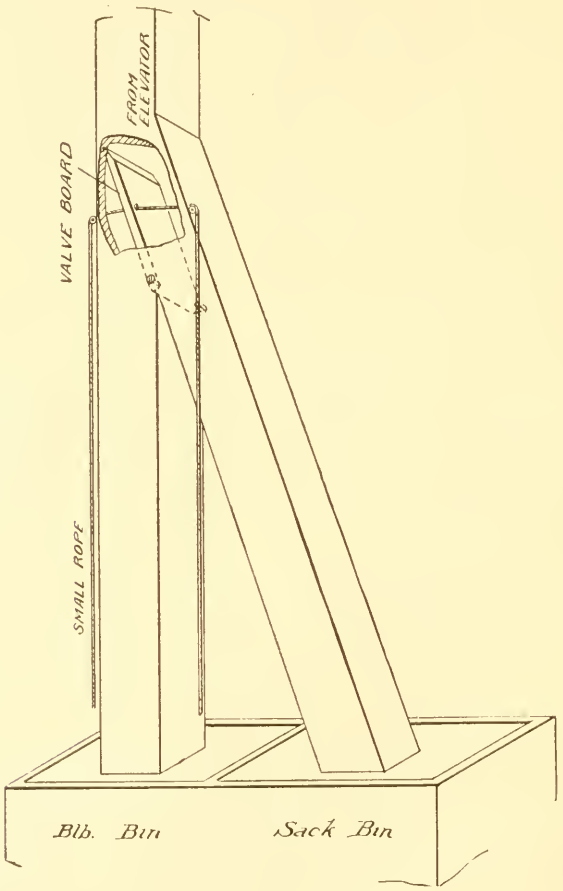
A small hand hole in a tin spout is a great inconvenience and it is not necessary even when the spout is only 3 inches in diameter. Make the upper and lower ends of the hand-hole section of the spout



the same size. The center of the section should be larger, tapering gradually toward the ends. In this way there will be plenty of room for the hand and the size of the hole will not disfigure the spout. The hand hole can be covered by gluing a piece of cloth at upper end, letting it drop over the hole.

VALVE FOR SWITCHING FLOUR

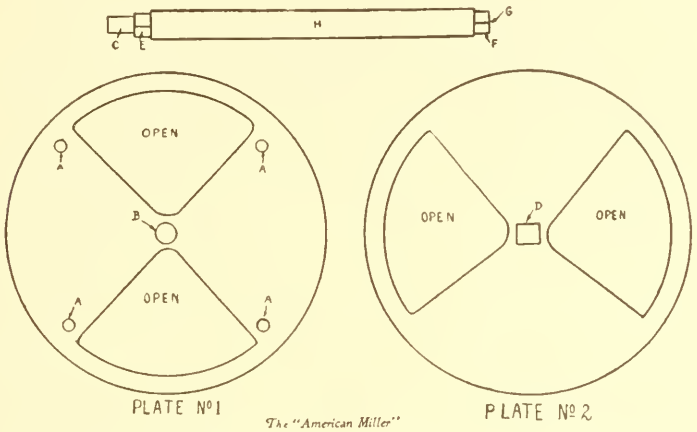
The valve, shown in the sketch, for changing flour from barrel to sack bins, will save miles of walking. The valve consists of a board dressed thin at top end, so as to fit snug against sides of spout, and the same depth of spout. It is fastened to the spout with screws



at the bottom, as shown, and controlled by a small rope extending through the two sides of the spout. Two small pulleys are fastened to the sides of the spout for the rope to pass through. The rope passes down through the floors between elevators and packers on grinding floor. A similar valve may be used under hopper scales.

GRAIN OUTLET

Where it is impracticable to use slide and lever this grain outlet will be found very convenient. It can be used as a bin outlet, or placed over conveyor in sink, or put in spout to regulate the flow. Plate No. 1 is fastened at *A-A-A-A*. It is stationary and Plate No. 2



revolves over it. The small shaft shown at the top is used to turn Plate No. 2. The end *C* fits in at *B* to hold the shaft rigid. *F* is square block to turn Plate No. 2, and fits in *D*. On the other end, *F* is square to turn shaft and *G* is an indicating mark to tell the exact position of Plate No. 2.

SPOUT KNOCKER

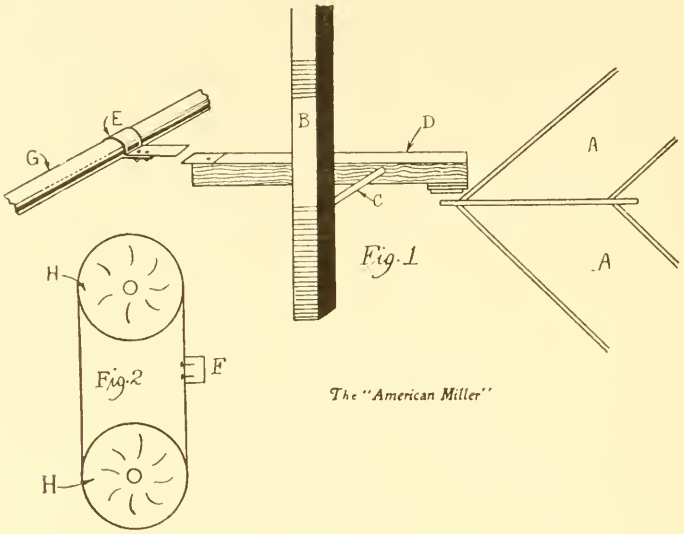
Here is a spout knocker that will be truly welcomed by millers who are bothered with a flat, choking spout. Of course, whenever possible, a flat spout should be thrown out but sometimes it is impossible to throw out the spout or to put in a conveyor.

Spouts *A-A* represent such a troublesome place. *B* shows a 2x4 hanger and *C* a bolt run through the hanger to support *D*, the hammer. The latter is made of 2x2 and on the end that strikes the spout is fastened leather pieces to avoid damaging the spout. A weight may also be required on this end to jar the spout to a greater degree. On the other end of the hammer is a slotted strap of iron, and by moving in or out the stroke of hammer may be made greater or less.

The clamp *E* is made of galvanized iron about 2 inches wide, fastened tightly around shaft and held by bolts. At each revolution of the clamp the hammer is raised and released, allowing hammer to fall

on spout and jarring any stock loose that has started to stick at the joint.

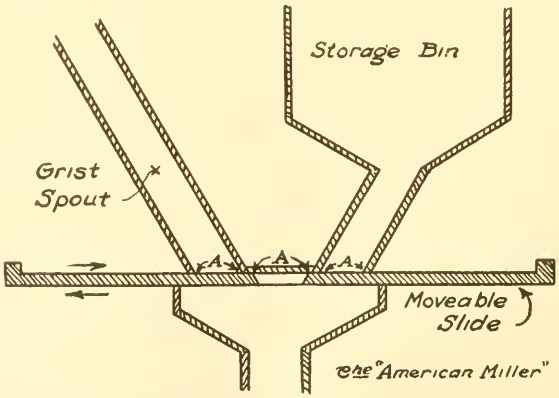
Should the shaft near at hand be too high speed, a small wooden pulley *H* could be put on the shaft *G*, as in Fig. 2, and another



pulley *H'* set up below and belted, with a wooden block *F* fastened to the belt. This would lessen the blows of the hammer according to the length of the belt.

GRAIN VALVE FOR SMALL MILL

In the smaller mill where custom work is done and interruptions to the general milling from the stock bin are likely to occur, the



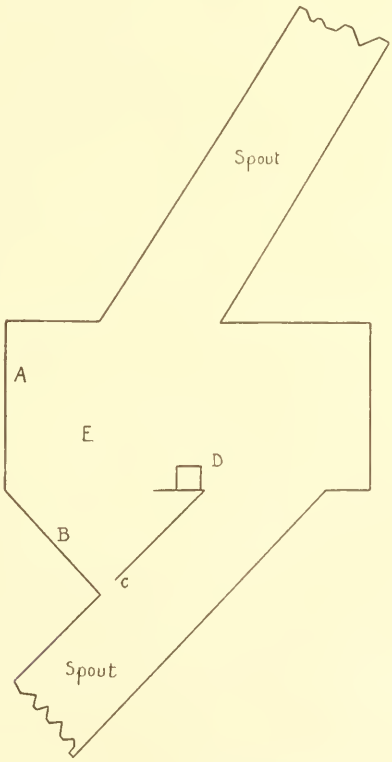
device here suggested may be of value. The cut-off from the storage bin is made as a movable slide between two runners not shown in

the sketch. The spout from the customer's hopper is also run to this slide.

With such a valve there are three available positions, viz.: Grain from storage, no grain, or grain for custom grinding. The opening in the slide is of width *A*, and equal to the areas of the stock and grist spouts. Sufficient room is left between these spouts for the cut-off position, when no grain will be going to the mill.

CHECK BOX

Where streams of wheat or other coarse material fall through several floors, the flow should be broken by having check boxes placed on each floor or immediately under floor. Check boxes are usually



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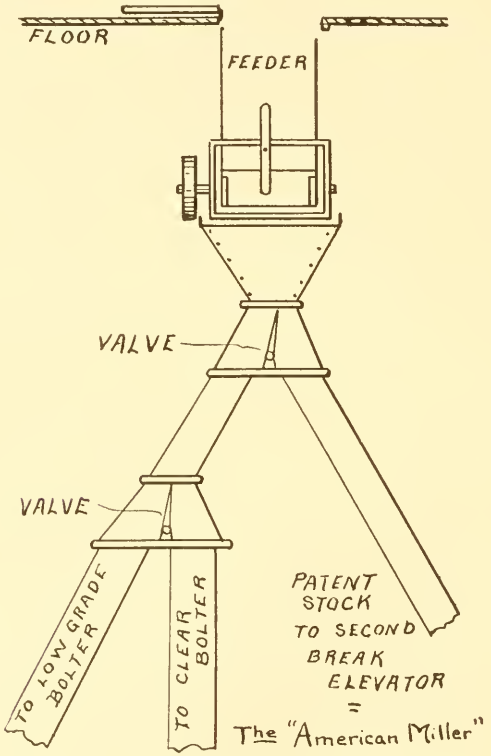
made so there will be a small amount of wheat retained in them at *E*, and this makes a breeding place for weevil and other vermin. By putting a pocket, *B*, as shown, under *E* with a small slot, *C*, in the

spout, a small amount will always pass through, and enough will be held back in *E* to break the fall. *A* and *B* should be lined with iron.

SPOUTS FOR WORKING OVER CHOKE STOCK

In most small mills, choke-ups of all kinds are dumped in the feed bins. An arrangement of spouts such as is shown in the

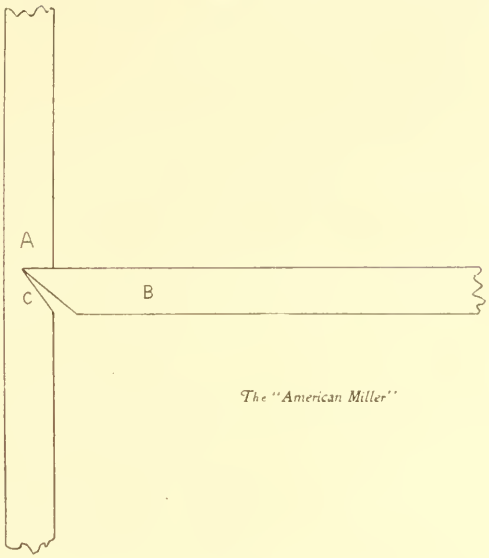


accompanying drawing would effect a very material saving during these times of high-priced flour. Feeders should be placed beneath the top floor so as to give a good fall to the different elevators.

NON-LEAKING GRAIN VALVE

Often when there is a plain slide valve to shut off grain in a spout it will get some obstruction under it and fail to entirely shut off the grain. Then when the bottom of the spout gets worn or the end of the slide becomes worn away unevenly it is impossible to

entirely shut off the grain. When such a slide valve is installed



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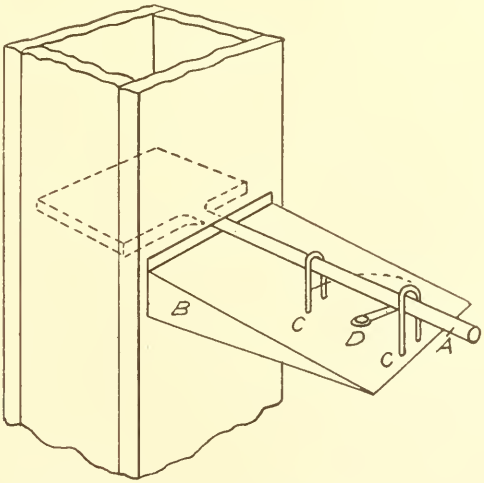
where the slide *B* strikes the bottom of the spout *A*, cut a notch *C* into which the point of *B* enters, which effectually prevents leakage.

SLIDE FASTENER

This simple arrangement has shown itself to be a quick and



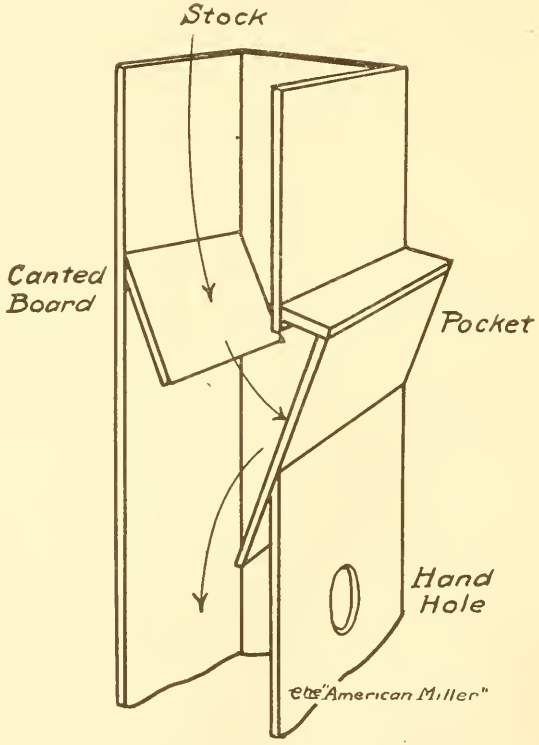
sure fastener for slides in grain bins, spouts, etc. A wedge-shaped block of wood, *B*, is screwed to the bin or spout as shown in the

illustration and the staples *C*, *C*, driven so as to allow the handle *A* to move readily.

The fastener, which acts as a lock on *A*, is screwed to the wedge at *D* in such a manner that it can be moved around in the radius indicated by the dotted line. When pushed toward the spout it will lock the slide effectually and prevent any slipping or leakage.

TO STOP BLOWING OUT STOCK

One of the most common complaints and often one of considerable importance in spout trouble, is the blowing of stock out through the hand hole. To stop this, make a pocket as shown in the cut

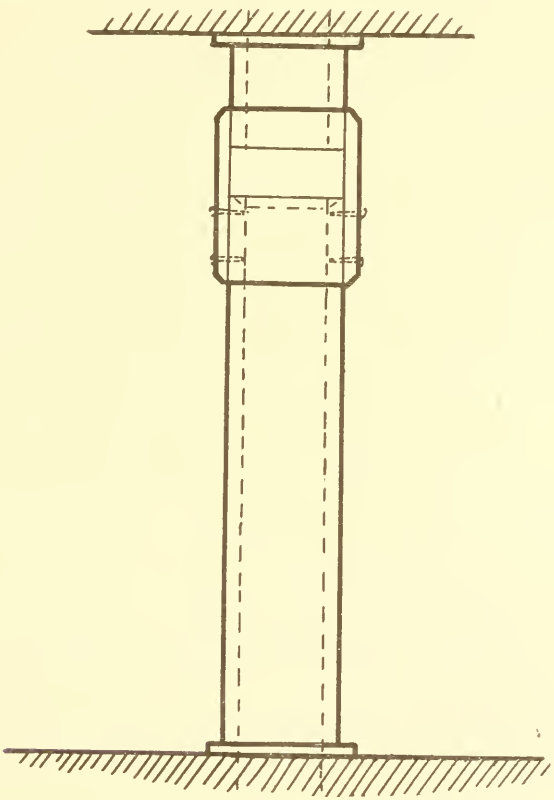


and then put in a canted board so that the stock is first thrown into this pocket and then off and away from the hand-hole side. The object of the pocket, of course, is to prevent crowding and choking. With the pocket the area of spout is kept nearly the same. The hand hole is now out of the direct stream line, but its use is unimpaired.

SPOUT FOR WHEAT BINS

Ordinary flat bottom wheat bins generally settle and sag more or less as the load is placed in them or rise as it is taken out. This being the case, spouts running from one floor to another in close proximity or connected to bins are often torn loose. The accompanying sketch illustrates a spout which will give no cause for complaint.

A stub is fastened to the top floor in the usual way. A spout

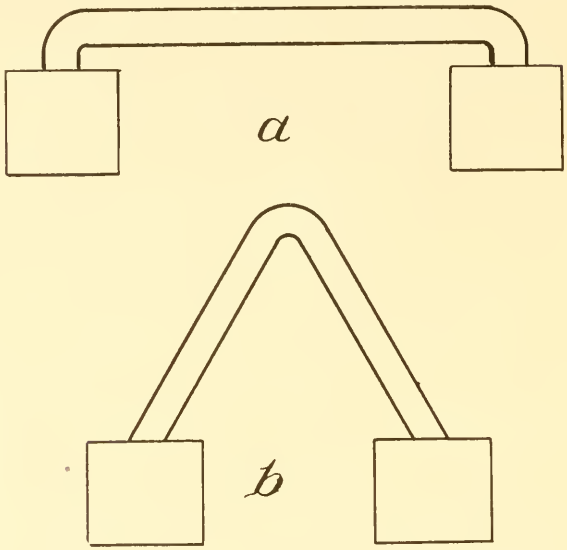


of the same size is extended from the floor to within a few inches of the stub. Boards about 12 inches long are fitted around the longer spout at the top, extending well over the stub and practically forming a spout around the two spouts. This casing is fastened only to the lower or longer spout, so that the stub can slip up and down snugly in it. This idea is handy where weight deflections occur with loaded bins.

SPOUT FOR WEAK AIR CURRENTS

Very often we find horizontal spouts with weak air currents, such as a return draft from a dust collector and the like, very liable to fill up. The cut *a* represents such a spout.

Those having trouble with spouts of this kind find that the



arrangement shown in cut *b* is much better, as the only place that can possibly fill up is the elbow at the top.

An opening in the spout near the elbow, with a hand-hole cover, is very convenient; or if the spout is large, a part of the lid can be sawed out. With an entrance in the elbow it is very little trouble to keep it clean.

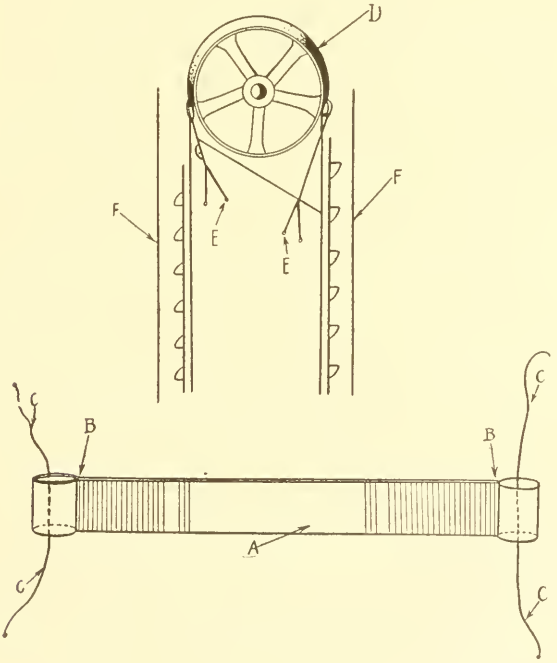
CHAPTER III

ELEVATORS AND CONVEYORS

BELTING ELEVATOR ON RUN

When one is installing a new elevator or repairing one that has pulled apart, and it is desired that it be done without closing down the plant, this method of belting elevator "on the run" may solve the problem.

Take a piece of cotton belting the same width of elevator head pulley and have it long enough to go around pulley from leg to leg.



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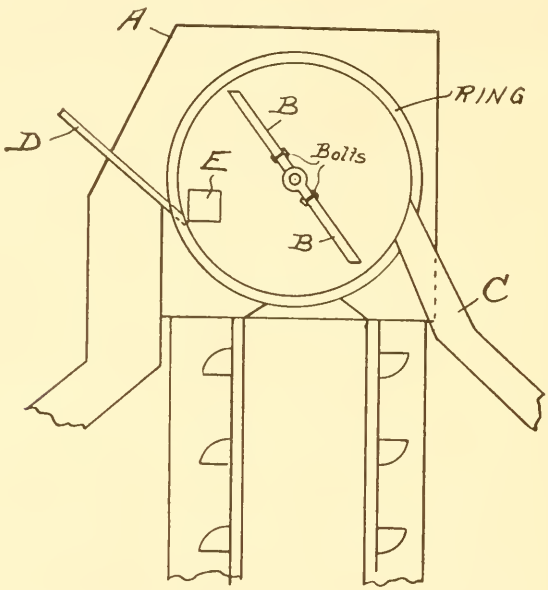
At each end of belt, as shown in the sketch, fold it back and rivet or bolt so as to have a place to insert a rope, as at *B*, then place over pulley, *D*, and draw around tight and tie at *E* around each leg. Then one is ready to put in elevator belt.

Slip the elevator belt around and fasten together at most convenient place. When it is put together simply untie rope on down side first, then on up side, then catch hold of ropes on down side and pull belt out and the elevator starts off.

CHANGING DISCHARGE OF STOCK FROM ELEVATOR

An effective method of changing the discharge of stock from an elevator is shown herewith. *A* is the elevator head; *B-B* are two strips of wood, 3 inches wide at the ends, clamped by shaft of ⅜-inch

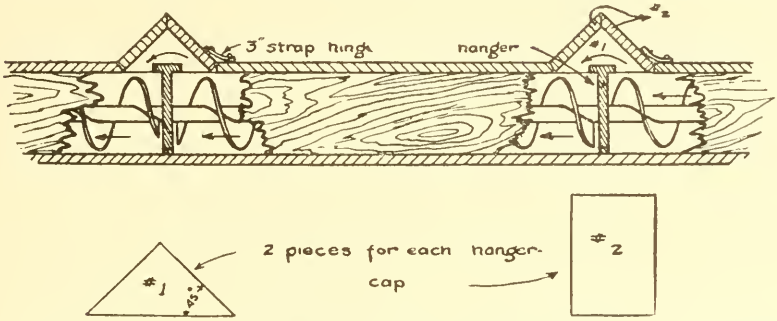


bolts. The ends of strips run about-one-half inch from a stationary ring 4 inches wide on the head of elevator and throw the stock out into new discharge spout. The changed discharge is indicated by *C*, while *D* is a slide to shut off old discharge and *E* indicates where stock flows into new discharge.

BY-PASS FOR CONVEYOR

Quite often a conveyor that is slightly overloaded will choke at the hangers, because the stock or grain cannot pass as freely at the hanger as it can in the spaces between supports. To overcome this make caps to go over these bearings, enabling the grain or stock

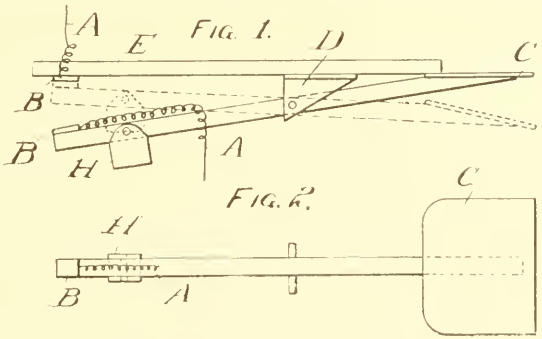
that did not pass through at hanger to pass over the top and relieve the choking tendency. This will work extra well on wheat-tempering



conveyor or other places where stock conveys badly. Furthermore, the capacity of the conveyor can be almost doubled by putting on these by-passes.

RELIABLE CONVEYOR ALARM

Here is a little device that can be fastened to the bottom of a conveyor and never fails to give the alarm when wheat starts through. *E* is a piece of board about 4x12 inches. At *B* is fastened a piece of copper, to which is attached a copper wire. The supporting brackets, of

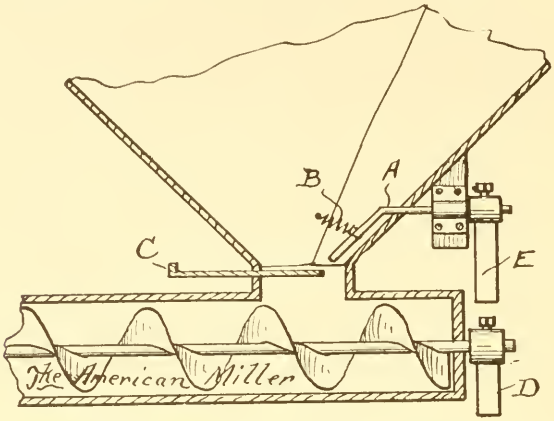


which there are two, are indicated by *D*. The part *C* consists of a 1x1-inch stick, about 12 inches long, with a piece of tin at one end. At the other end is a piece of copper, wired as shown. At *H* is fastened a weight that will over-balance the tongue.

When put together as shown in Fig. 1, it can be connected up to a bell on any floor of the mill, or several floors, and will give the alarm as soon as the wheat starts through the opening to which tongue *C* is attached.

FEEDING SCREENINGS TO CONVEYOR

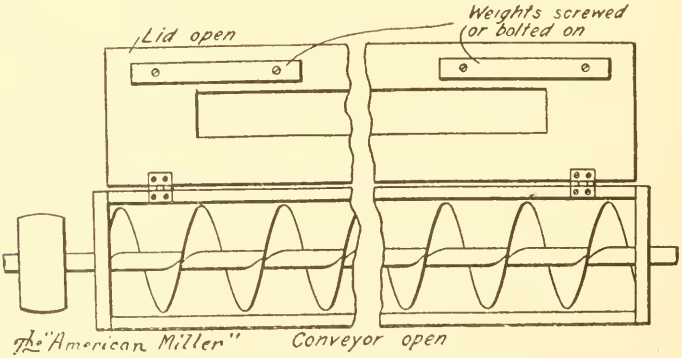
To feed screenings or off-grade grain uniformly into a conveyor, take a piece of 5/8-inch round iron the desired length and bend it as at *A* in the drawing. Fix a bearing under the hopper as shown, then



have pieces *D* and *E* made, one to fit the conveyor shaft, the other for the 5/8-inch iron. The iron *E* must be the longer to give the tongue plenty of through. At *B* fasten a strong spring. *C* is the slide to hopper. When the conveyor is running it will work the feeder very nicely.

CHOKED CONVEYOR WARNING

The most effective method of preventing trouble from a choked conveyor is shown in the sketch. Remove the hooks or catches

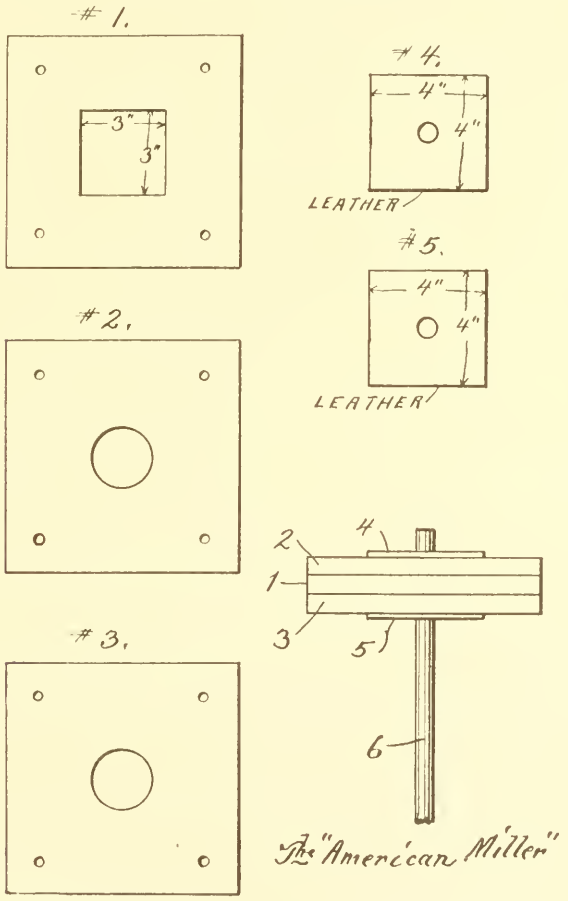


from the lid of conveyor and screw weights on the lid, just heavy enough to prevent dusting out and warping. It will be better for the

sake of appearance to put the weights on the under side of the lid. When the conveyor is choked, the stock will push up the lid of flow over the sides to the floor. This will quickly be noticed by someone and save the trouble of fixing a broken conveyor, or the belt coming off the reel and causing more chokes.

HOME-MADE CONVEYOR BEARING

Cut three pieces of pine or hardwood the size of the conveyor box. In the center of Nos. 2 and 3 make a hole ¾ of an inch

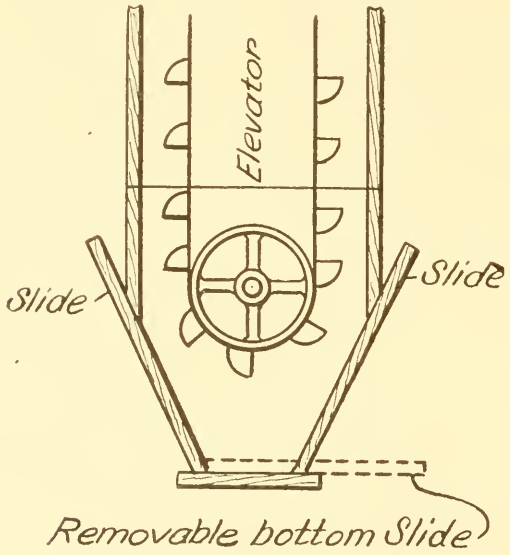


larger than the size of shaft. In the other, No. 1, cut a 3-inch-square hole in the center. Bolt all three of them together as shown in diagram with No. 1 in the middle.

Now take two pieces of leather belt 4 inches square and tack in the center, one on each side. Take a short piece of shaft the desired size and insert just so the end comes through the leather. Drill a ½-inch hole through from the top and also a ⅛-inch hole to let out the air. Pour the babbit, let cool and turn the shaft out as in some cases it is inclined to stick. Redrill the oil hole and scrape the bearing, which will be found to be a very durable one.

REMOVABLE BOTTOM FOR ELEVATORS

Unchoking an ordinary elevator is a rather dangerous task. The elevator can just as well be made with a removable bottom slide,

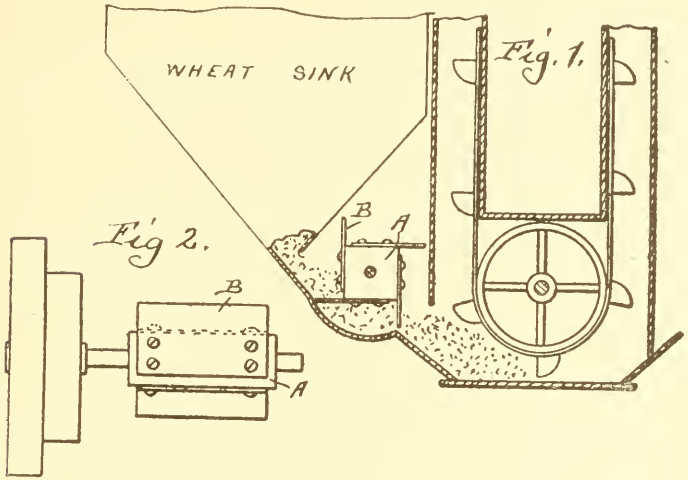


which will do away with danger and greatly facilitate cleaning out. If there is a choke about the mill, the removable bottom, as shown in the sketch, can be taken out and the boot readily cleaned.

DEPENDABLE ELEVATOR FEEDER

The ordinary slide gate can be depended upon when the wheat runs free from trash. But in taking in wheat from the farmer, straw, corn, corn silks and shucks, corn cobs, and whole ears at times, are found. Place a feeder between the sink and elevator as shown in the sketch. *A* represents a square piece of wood and *B* represents an iron plate screwed fast to it, using one of these plates on each side of the square as shown in Fig. 1.

Fig. 2 shows how the plates are screwed on and how the journals are turned in square piece. It also shows two pulleys on the shaft for receiving drive from a like two places on elevator journal. In



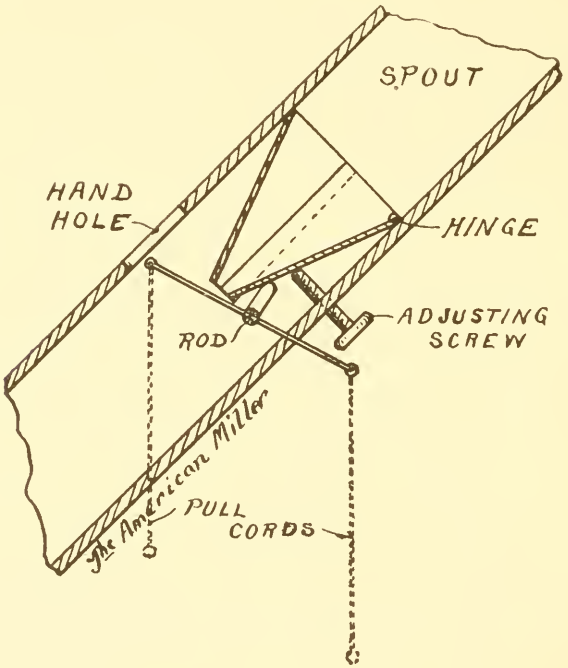
some instances it may be well to have a differential of three pulleys in order to regulate the feed to fit individual needs. With this arrangement the elevator will never choke in starting, as the feeder only feeds when elevator is in motion, the stops when it stops. It will be necessary to use a cross belt in driving it.

CHAPTER IV

RECEIVING, SEPARATING AND CLEANING

FEEDING DEVICE FOR MILLING SEPARATOR

It is very difficult to use the long feed gate on the milling separator to regulate the flow of wheat from the bin, for the reason that even if the wheat has been run over a receiving separator these perforations are so much larger that it will let through weed heads



and other particles that will lodge in an opening of perhaps ⅛-inch by 24 inches. Then comes the real trouble—the lessened amount of wheat in the wetting conveyor, where the wheat enters later, is getting too wet, and then one goes to another story of the mill to clean and adjust the feed again, only to find later that the flow of wheat is too much.

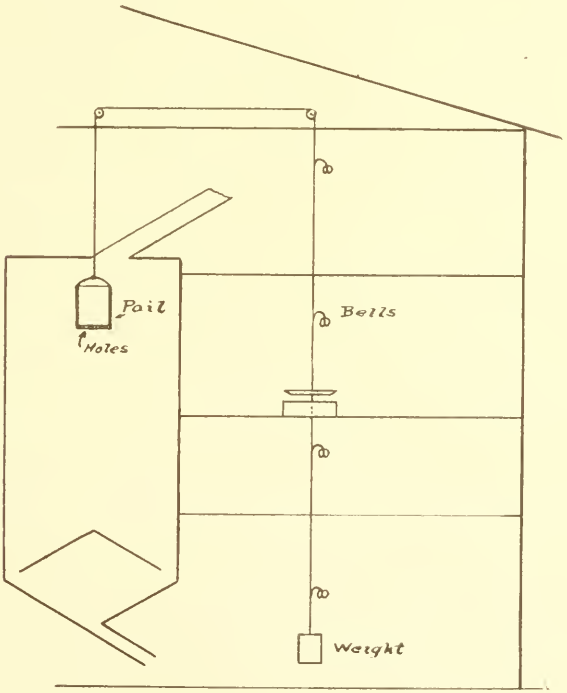
Moreover, if the long separator feed gate is opened so little as to let through the same amount of wheat as an inch or more hole, it is

difficult to hold regular amount of flow. It will be found that by using the funnel-shaped feeder shown herewith, the flow is the same all the time and it will need no attention.

Take heavy sheet iron and form two half funnel shaped pieces, large end to fit the square spout and the small end for a hole about 1 inch square, one piece to work into the other for shutting off. One of these pieces is hinged. The opening in controlled by the adjusting screw and rod shown in sketch.

ALARM FOR FEEDING CLEANERS

An arrangement which will tell when the wheat runs off the cleaners is illustrated by the sketch herewith. A pail with a perforated

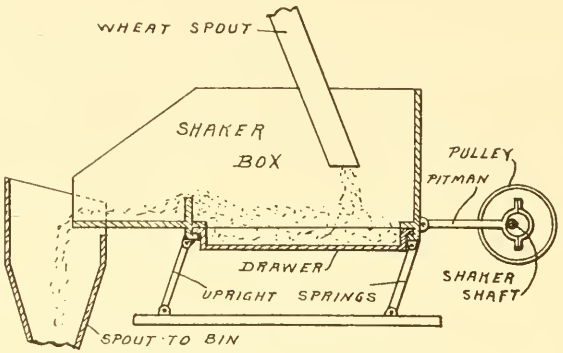


bottom is suspended in the tempering bin and is connected by a wire to bells on each floor. When the incoming wheat stops, the pail will empty and the weight will cause the block of wood to engage the line-shaft and start the bells to ringing.

AN AUXILIARY CLEANER

The little device shown consists of a little shaker frame with sides 3 inches high, a box 10x20 inches made to fit the shaker frame, and a drawer 10x16 inches. The sides and rear end are the same size as the frame, but the cross-piece is only 2 inches high.

This little shaker is placed where it will catch the wheat before it gets to the grinding bin. The box fills with wheat till it runs over the



cross-piece to bin. In this way all nails, tacks, pieces of iron, gravel, etc., are separated from the wheat and fall into the drawer, while the wheat goes over the cross piece into the bin free of foreign substances.

It is only necessary to try one of these little separators to see how many tacks and nail-heads pass the magnets. The drawer pulls out and is fastened in place with a button. It should be cleaned out once a day.

REGULATING WHEAT TO CLEANERS

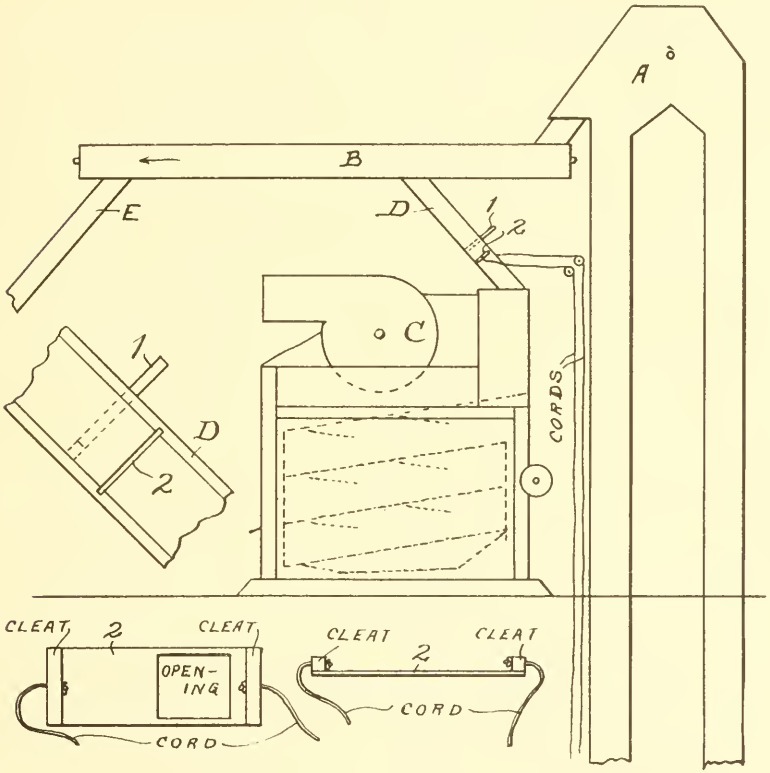
To save running to the separator every time the wheat has to be shut off the arrangement shown herewith has been devised for regulation of the wheat to cleaners.

With this idea installed, if the miller finds the stock bin too full he merely pulls the "shut-off" cord and all the wheat will pass back to the garner by way of the conveyor or "by-path" spout. If an adjustment is needed or a repair must be made, or a choke occurs, he can shut off his wheat on the spot. Then when the repair is made or the choke relieved he pulls the "put-on" cord and the wheat is on again.

Taking up the sketch shown herewith, *A* represents the elevator from the garner, *B* the conveyor, *C* the milling separator, *D* the spout to the separator and *E* the spout back to the garner. No. 1 is

the common wooden slide to regulate the quantity of wheat on the separator while No. 2 is the special iron slide to put on or shut off the wheat to the separator without disturbing slide No. 1.

Slide No. 2 is made as shown in the smaller sketches and is inserted in the spout, to run the opposite way from slide No. 1 by means of saw cuts as indicated in the drawing at the upper left. It is



made from a piece of No. 2 sheet iron with an opening cut in one-half of it which is just equal to the inside measurement of the spout. Wooden cleats an inch square are screwed to each end of the slide with holes through each cleat for the sash cord which regulates the slide.

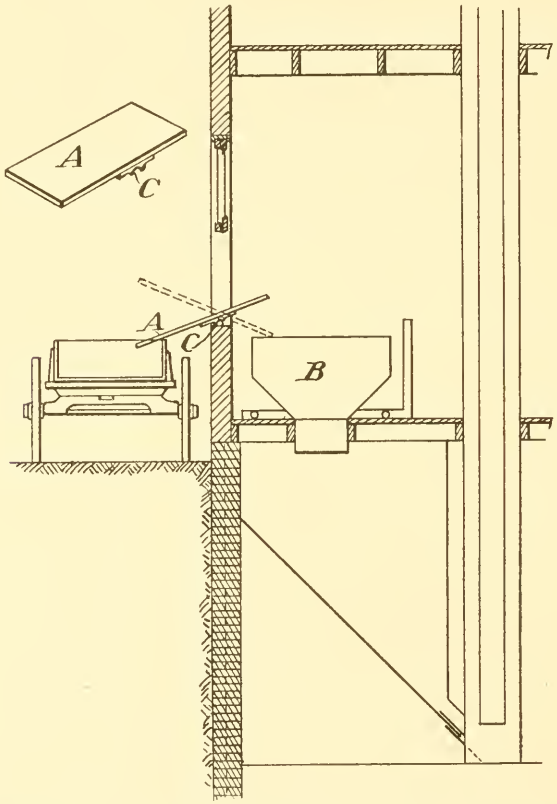
The method of operation is apparent. The two sash cords, one to open the slide, the other to close it, are led over pulleys, if necessary, to the elevator leg, where they are out of the way. Then

the cords are led through small auger holes to all the other floors.

In case a "by-path" spout is used instead of a conveyor, said spout should have a small pocket or hopper attached to the bottom so that it will fill up spout *D*, the surplus going, as shown, to the garner.

RECEIVING SACKED GRAIN

The sketch shows one of the best ways of receiving grain in localities where the farmers still use grain sacks, and can be installed



any place where the roadway is about on a level with the mill floor.

As indicated, *A* is a "teeter" board which reaches from the wagon bed to *B*, the hopper on scale, and tips on a round piece of wood at *C*. The window is raised and the board—a light one—put in place. The farmer tilts the bag of grain onto it, then takes the long end of the board and raises it till the sack slides in. The

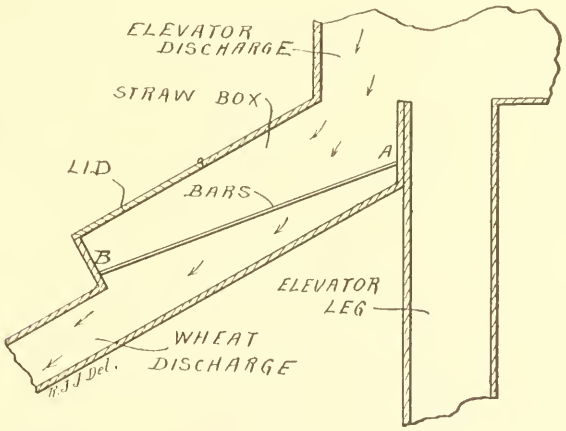
receiver then cuts the string and dumps the wheat into the hopper scale.

A small trap in the bottom of the scale, with a handle reaching to the top is desirable. It will empty into the hopper below in less than a minute. The miller does the work by the gravity system and the farmer will be well pleased with the arrangement, even though he does get the long end of the board.

Should the location be such that the road is on a level with the basement floor on the other side of the mill, a chute can be put in to reach to the wagon; then all lifting in handling grain is eliminated.

STRAW CATCHER

The device illustrated can be used to remove straws, strings, trash, etc., before the wheat goes to the receiving separator. The wheat may be taken from the wagondump by a large elevator which



throws it into sinks in the basement from which it is fed to the elevator carrying it to the receiving separator.

In its construction, boards 12 inches wide are used, making the spout 10 inches wide and 12 inches deep inside. Cut off the point of the spout at the upper end, till the hole is 10 inches square, to fit the discharge of the elevator and at a point five feet down the spout, cut down the fillets to 6 inches.

Then place bars 5 feet long, ¾-inch wide and 3-16-inch thick set on edge, *A*, near the bottom of the spout at the upper end to *B*,

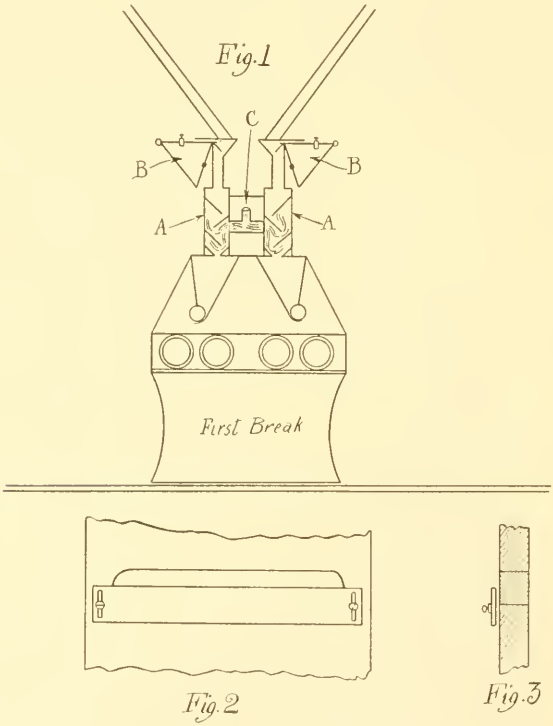
at the bottom end of the straw box. Use 9 bars so the spaces are nearly an inch wide or a little closer.

The wheat entering on top of the bars falls through and runs down the spout. The straws are caught by the bars and the force of the striking wheat drives them down to point B, where there is a lid to remove them.

ASPIRATING WHEAT BEFORE FIRST BREAK FEEDER

Those who have never tried aspirating wheat, supposedly clean, just before entering first break feeder, would be surprised and delighted at the results obtained if they were to do so.

Fig. 1 illustrates rolls, aspirator and feed governor, *A* being the

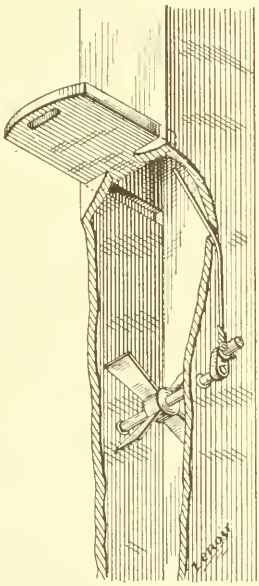


aspirator, *B* the feed governor and *C* a 3-inch suction pipe. The aspirator is constructed of wood, a little wider, both ways, than the feed governor and about as high. Place deflecting boards as shown in the sketch and line the whole device to prevent wear.

A section of the front is shown in Fig. 2. This shows inlet for air, running clear across from side to side. It is made ¾-inch wide and placed just beneath the deflector boards. The regulator gate is slotted on each end and held in place by a small eye-screw with washer. Fig. 3 shows a sectional end view. The aspirator may be connected to an independent fan or attached to a main draft pipe of wheat cleaning machines.

KEEPING DIRTY WHEAT RUNNING

The device illustrated herewith is for the purpose of keeping dirty wheat running to receiving separator from farmer's wagon. The



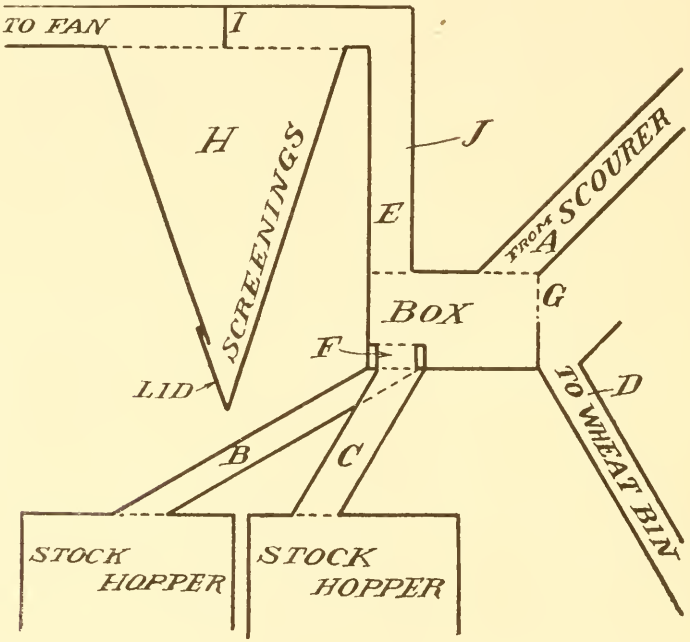
paddle wheel inside of the spout is run by the stream of wheat and outside the spout, on the shaft, is a crank with a heavy wire attached. The revolving wheel keeps the wire poking under the slide, so there is no chance for straw or other foreign matter to accumulate.

COMBINATION WHEAT REGULATOR AND SUCTION

This combination wheat regulator and suction is to be placed in the wheat spout that leads from the last scourer to the stock hoppers. It serves as an overflow for stock hoppers, a valve that never leaks grain

and a suction superior to the suctions now used on grain cleaning machines.

It consists of a covered box 13 inches long, 9 inches wide and 6 inches deep, inside measure, lined with sheet iron where the wheat is likely to strike. The wheat enters through spout *A*, which has a fall of 30 degrees, giving the wheat sufficient force to throw it to the other end of the box, where it escapes by spout *B* or spout *C*, which lead to



galvanized iron stock hoppers. The board *F* has a hole the size of the spout openings. Pushed to correspond with either spout, it entirely closes the other.

In the end of the box, under spout *A*, is a hole *G*, 5 inches wide and 3 inches deep from the top of the box. If either stock hopper fills and backs up spout, when box fills sufficiently the grain runs out at *G* and falls into spout *D*, which returns to bin from which wheat is drawn for scourers.

The letter *E* indicates a suction spout, 4x6 inches inside, rising 4 feet vertically, thence horizontally through screenings pocket *H* to an independent fan, which creates a strong suction; but it can be connected to scourer fan or eliminated altogether.

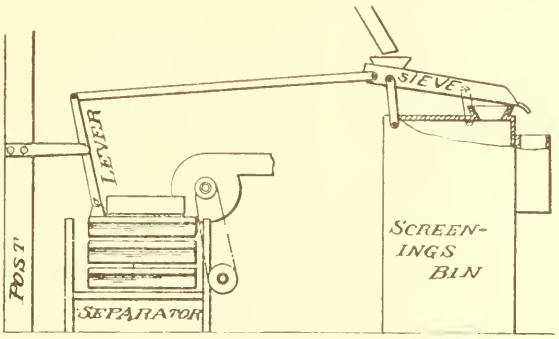
The air entering at *G* is drawn through the wheat in almost the same direction the grain is traveling and carries lighter material with it; and in the screenings may be found broken wheat, shriveled wheat, cockle and chess, but never a grain of good milling wheat. It is best to make the screenings pocket wide and deep, cutting the bottom out of suction trunk and putting a stop across spout at *I*. The slide, *J*, regulates the suction.

The spout *A* is 3 inches wide inside and can scour 60 bushels of wheat per hour. The trouble it saves in watching the stock hoppers pays for its cost every month and a choked scourer is impossible.

SHAKER FOR SIEVE BOX

The drawing shows a shaker for a small sieve box which can be used to separate strings, straws, pieces of coal, etc., from the screenings before sending them to the screenings roll.

Fasten one end of lever to the sieve frame of the separator with

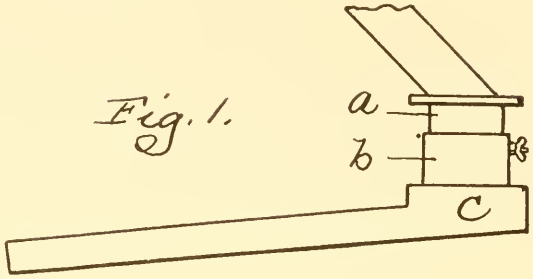


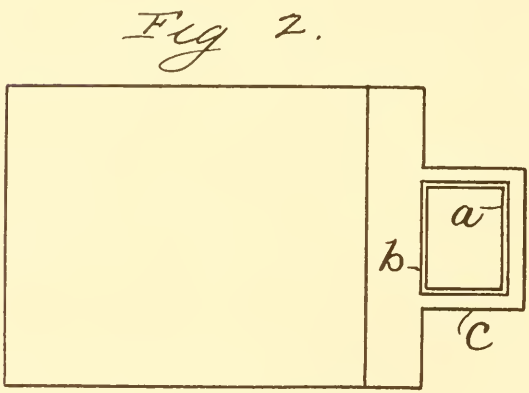
a thumb-screw, so that it can be loosened when not in use, and the other end of the lever to a stick 7/8-inch by 1 inch, attached to sieve box. The latter is held up by four strips of iron, so that it will swing easily.

FEEDER FOR WHEAT SEPARATOR

In Fig. 1, *a* is a piece of tin—stovepipe iron is best—shaped as in Fig. 2; *b* is made in the same form but a trifle larger, so as to slip over *a*. A small bolt with a thumb-screw holds the two together, *a* having a hole just large enough to enter the bolt and *b* having a slot so that it can be slipped up and down in order to adjust the feed.

The part marked *c* is an extension to the separator sieve, as shown in Fig. 2. There should not be over ½ inch of space all around between the spout *b* and the extension *c*, so that practically all





of the wheat must pass out directly below *b* on the side shake. This distributes the grain nicely.

With this feeder there is very little trouble from foreign matter choking the spout. In elevating when the smutting bin has been empty, the grain will not shoot through. The feed will stop feeding the moment the separator stops and will never cause a choke.

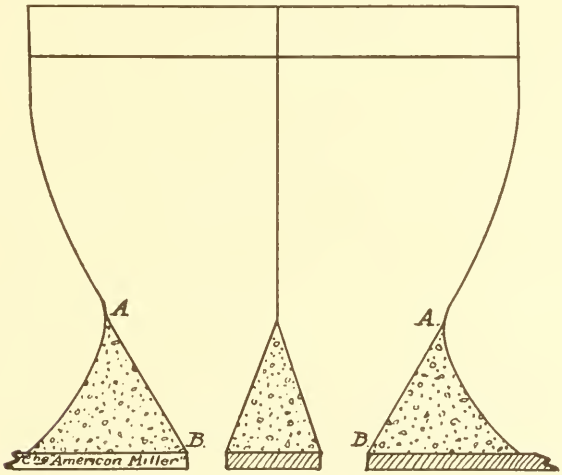
The extension *c* and a part of the main sieve box should be about horizontal, as in the cut, and covered with stovepipe iron.

CHAPTER V

ROLL AUXILIARIES

CONCRETE FORM FOR ROLL FRAME

To permit a clean, easy flow of stock from the roll stand to the spout hole, the following plan is suggested: Make a form in which to run concrete and use it in connection with frame. The rolls must be taken out and the form carefully placed so that the top of it will



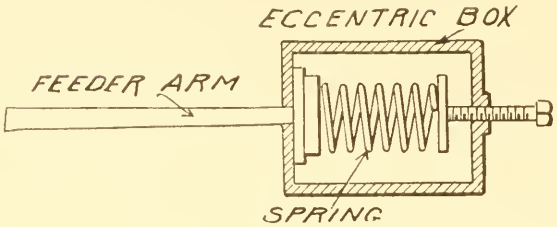
come up flush at *A* and the slope should be so designed that it slants four ways to the mouth of the spout *B*. If this is done, all the stock will run out clean and evenly. Stability will be given to the stand and a good tight job will prevent waste by leakage.

After hardening and removal of any form, it is desirable that the surface should be thoroughly cleaned and made as smooth as possible, thus preventing the collection of any foreign matter, insects or lodgments of dirt.

ADJUSTING THE ROLL FEEDER

Occasionally there is trouble for the operative when the roll feeder stops and the stock backs up to the other machine, caused by the eccentric box becoming worn or the washer worn through the center by the set screw, which will surely stop the feeder from

vibrating. One will generally obtain a piece of leather or a square iron washer to tighten against the eccentric. Now a more suitable

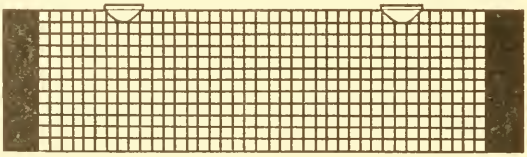


way to overcome the trouble is to place an iron washer against the eccentric block, then a short steel spring and another iron washer to screw against, when the feeder will run along nicely for months. The drawing shows clearly how it is done.

IMPROVED ROLL HOUSING DOOR

The roll feeder housing of the first break roll is very apt to rot and warp from the moisture in the wheat as it comes from the steamer immediately ahead of the roll.

To overcome this moisture in the feeder housing remove the cloth



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from the door and tack wire cloth on instead. It can be coarse enough to allow the circulation of plenty of air, but fine enough so that wheat cannot pass through.

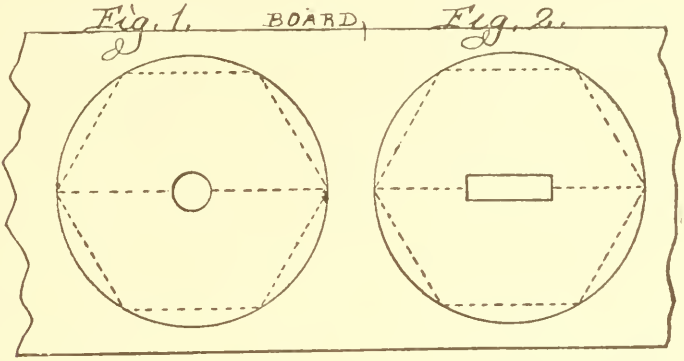
SHIPPING CRATE FOR ROLLS

Handling mill rolls is hard work; anything that can be done to lighten the burden of those who must handle these rolls in the mill or on the road, should be done, especially when it costs nothing and protects the roll.

The drawing, Fig. 1, shows how to make the blocks that are placed at each end of the roll; Fig. 2 shows the blocks placed at the extreme end of the crate. The object of the end blocks is to protect the crate

from breakage and at the same time protect the roll journal. The square opening in Fig. 2 is intended as a handle or hand-hold.

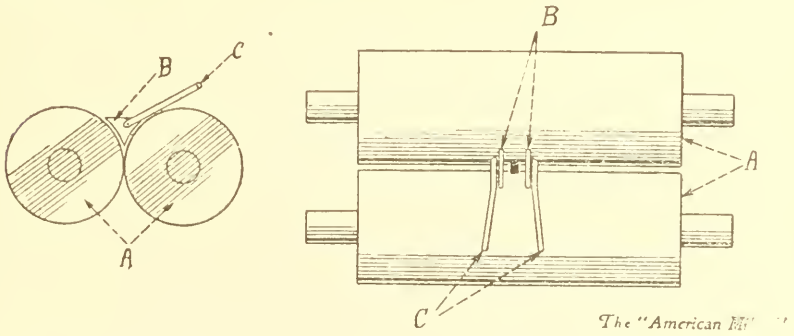
For a 9-inch roll set your dividers at 5½ inches, scribe a circle, divide the circle into six equal parts by leaving the dividers just as



they were. Now scribe dotted lines and saw off at dotted lines right through the center and board up. It will be seen that each crate will require four of these blocks, or two of each. It will be found that a six-sided crate can be rolled much easier than a square one, and is much more durable.

REMOVING OBSTRUCTIONS FROM REVOLVING ROLLS

Many a miller has lost his hand or fingers by coming into too close proximity to the grinding contact of mill rolls. Everyone must



take precautions along these lines. Accidents, however, will happen. A nut, bolt or various things may get loose, regardless of care, and get into the rolls. If real small they may pass through; if large, they bound and slide along, wearing corrugations and themselves and other-

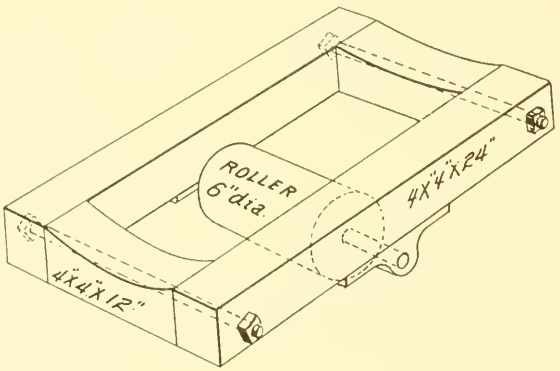
wise disturbing matters. One likes to have them out to save wear and tear. In an emergency the device shown fills the bill.

A represents end and top view of rolls, *B* the cast iron roll guides or saddles, riveted to handles, *C*, which are made of 3-16 by 1-inch band iron, 8 to 10 inches long. The dark object between represents some obstruction it is desired to remove. If you are going to do it, while rolls are in motion, use this device. Bore a hole in end of handles and hang on a nail near the rolls.

HANDLING LARGE ROLLS

Handling 9x24-inch, 9x30-inch or larger rolls is made easy by using a "dolly" especially constructed for moving them around the mill floor.

Make a frame of hardwood, of the dimensions indicated in the drawing, securely bolted together, the bolts extending all the way



across. The end pieces are hollowed out, as shown, and the parts on which the roll rests are covered with rubber.

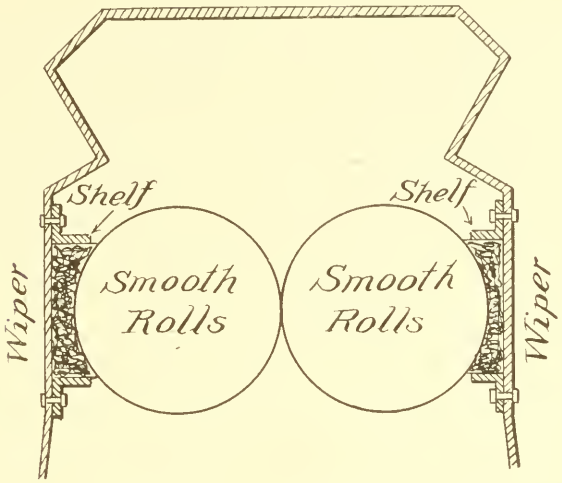
The roller on which the "dolly" travels is 6 inches in diameter, with a shaft through the center. It is bound with iron bands at each end.

By using this "dolly" one man can easily handle 9x42-inch rolls without damage to corrugations or surface of smooth rolls.

SUBSTITUTE FOR ROLL SCRAPER

This roll wiper is intended to take the place of faulty scrapers on smooth rolls. Put in a little shelf at the bottom of the roll, and tamp in cotton flour sacks until the space is filled. Press the top shelf down firmly on the packing and screw it on to the housing.

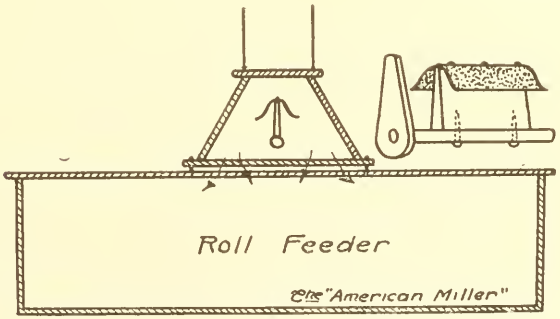
This wiper can be installed in a few minutes and it is claimed will do far better work than an iron scraper. When the packing is



worn out it can be quickly and easily replaced with new. However, a filling will last for a number of years.

FEED SPREADER

To obtain, from the spout, a more even distribution of grain to the long roll feeders, this little device is suggested. The main draw-

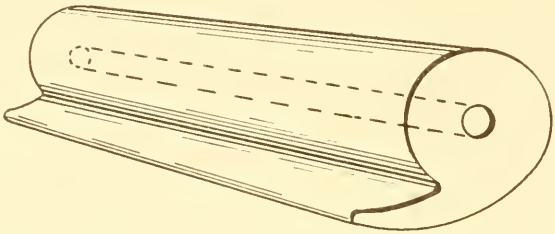


ing shows the spreader in place in the spout. The detail drawing indicates clearly its construction. A piece of rather heavy sheet iron or tin is bent into the desired shape. Such a shape as proposed throws the grain down and sideways too, as indicated by the arrows. The

valve tongue to which the spreader is attached is made from ordinary spouting timber and screws secure the whole together.

IMPROVED FEED GATE

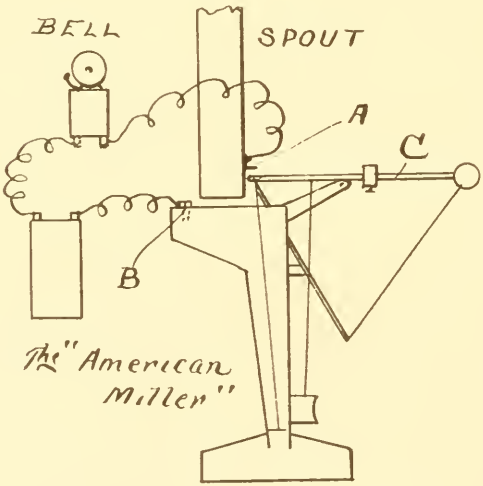
The sketch shows a feed gate for rolls that serves its purpose well.



It is made of ½-inch lumber and extends the full width of machine. When properly adjusted it will stay just where the miller puts it.

FIRST BREAK FEED ALARM

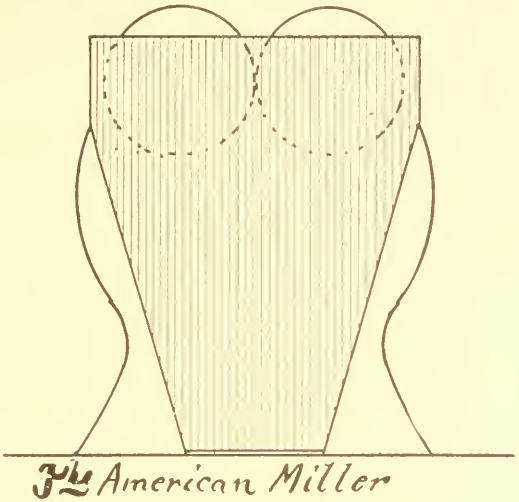
The following simple alarm device for first break feed has proven valuable. *A* is a piece of tin put on the wheat spout and furnishing



one terminal for the electric circuit. The second wire is attached to a bolt *B*, in the feed governor. When the governor is empty, the arm *C* is raised and touching *A* a complete circuit is formed, causing the bell to ring. The bell can be placed anywhere, so it can be easily heard.

SIMPLE GUARD FOR ROLL

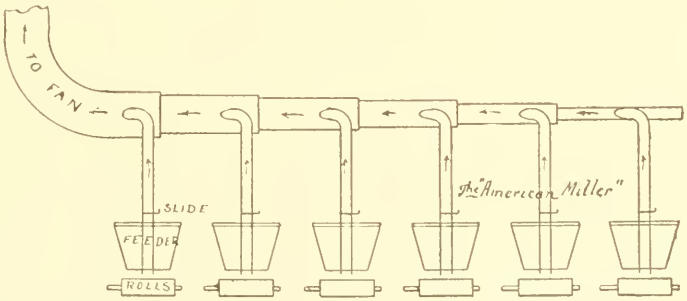
An additional sense of security in moving about the rolls may be had by placing a guard made of galvanized iron as in the diagram,



which is open on top to permit roll being oiled. The guard is screwed securely to the housing of the roll and to the floor.

SELF-CLEANING ROLL SUCTION

A self-cleaning roll suction which will not dough up consists of a draught spout 8 inches in diameter at the large end and which is



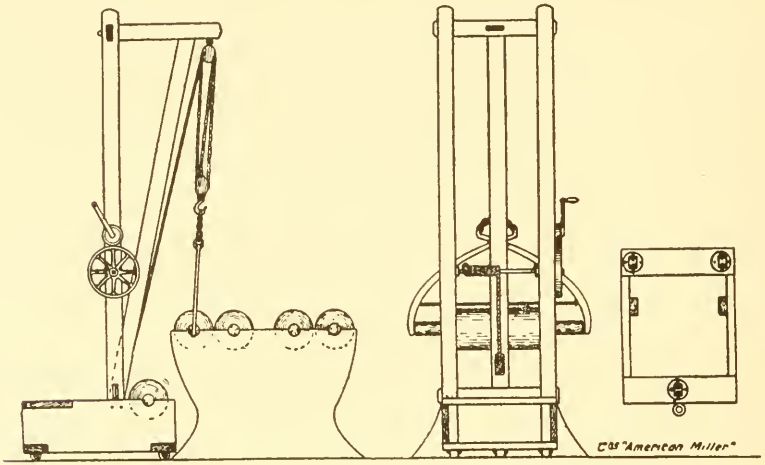
graduated down to 3 inches at the small end. It is made of galvanized sheet iron, the joints, of course, being air tight.

The upright spouts which are 3 inches in diameter, should pass down through the housing of rolls, between the feeders, and should have a free opening to the rolls as shown in the cut.

ROLL DERRICK

The derrick for rolls, which nearly explains itself in the sketch, is easily and cheaply built. Most of the material can be picked up about any mill. The upright posts can be made out of 4x4-inch hardwood; any good plank will do for the bottom. A pair of old stone bails can be used, or take an old wagon tire and have the blacksmith forge it out. An old pair of gears will do for the winch and almost any mill has a set of ¾-inch blocks.

Have the center points on the bails fit nicely into roll and centers. Drill two holes, one in each bail, just high enough to miss face of roll



by one inch. Fasten a ½-inch rod to one with a link, and straight-hook other end so it can be hooked into hole in other bail when the strain is on, making an absolute lock.

Stand on the plank back of the winch; raise roll gently until clear of roll frame, then slack to position on derrick base. Hitch a rope in eye on bottom and wheel it wherever desired. The three rollers underneath, on which the derrick stands, make this an easy task. One can lift a roll out or slack it back without any blocks, and do it easily, too. It is also easy to trundle to either side of roll line.

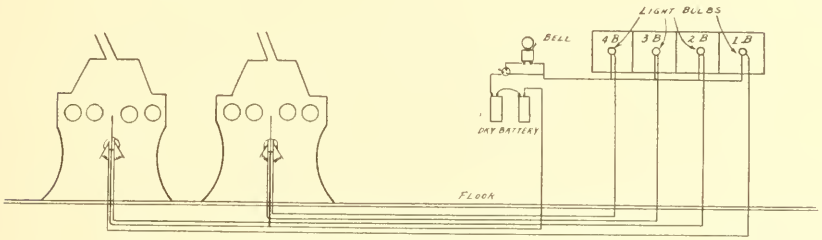
One can move this derrick out to the car or dray, open up roll box, pick roll out of box, drop it into base of derrick and into the mill again without any help. Nor is it necessary to scratch the floor all up, as some do, by sliding the boxes along it. Then it is so much

quicker than using a canvas or belt, as one does not have to slack the tension way off.

The width must be governed by size of rolls. Rolls should have about ¼-inch play each end, inside of base plank. The single roller or caster must be on outside or long end. This enables one to turn the derrick about easily. A good stop pin should be put in winch gear, if needed.

ELECTRIC ALARM FOR ROLLS

Directly under the rolls place hinged wickets, as shown in the sketch. Whenever a choke occurs these wickets are pressed down,



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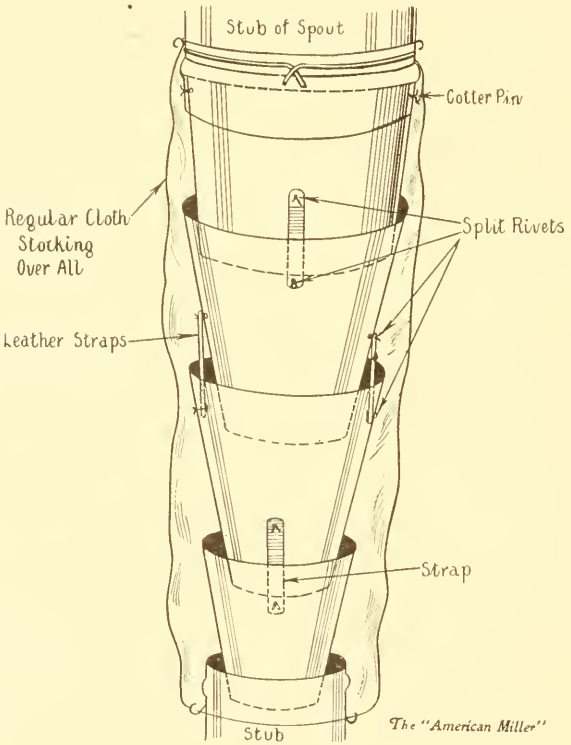
thus completing an electric circuit. There are four of these circuits, each running through an electric bell outfit and a small electric lamp. By following through these circuits it will be seen that not only does the bell ring, thus indicating trouble, but also the miller can tell just where the choke is as only one lamp is lighted for each pair of rolls. A switch is included in the circuit for cutting out the bell.

CHAPTER VI

SIFTERS AND BOLTERS

"EVERWEAR" FLEXIBLE SIFTER STOCKING

This device consists of a series of three or more pipe sections or tapered sleeves, made of tin or galvanized iron, hung vertically one from the other by rawhide straps about 1 inch wide and 4 inches



long, in such a way that frictionless movement is allowed in any direction and so tapered that they will fit any spout openings given.

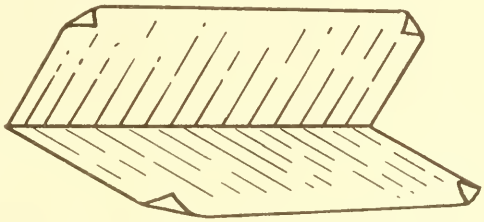
The top sleeve fits snugly inside the sifter stub, snapping into the beading, and is held in place by cotter pins or split rivets inserted diametrically opposite each other. The next sleeve is hung by a pair

of leather straps arranged at a 90-degree angle from the pair above so that the motion of the sifter is taken up from every side.

These tin sleeves entirely prevent the wear of sharp stock against the cloth spouts (which are always wearing through) and dusting is prevented by the regular stocking which is attached over those flexible sleeves in the usual way.

SEAL FOR HOLES IN BOLTER STOCKING

The stockings on a bolter are subject to continuous motion and strain and consequent wear. Small holes appear in time and quite a leakage occurs. To prevent this leakage and in a ready manner



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remedy the flaw, cut some squares of tin, ranging in size from ½ to 1 inch on a side. With pliers turn up the corners to right angles to form little clips, as suggested in the illustration. A supply of these may be kept in a small box and close at hand, near the bolters.

To apply upon noticing a hole, pinch a seal over the hole with the fingers and then it may be set up tight with the pliers. This operation can generally be done when the machine is in motion, so that no shut down or continued leakage is necessary.

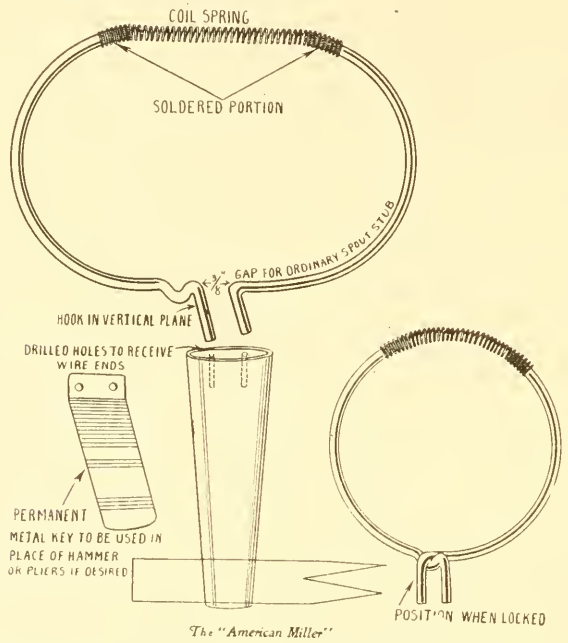
"LOCKTITE" SPRING STOCKING FASTENER

A very good spring stocking fastener consists of strong ⅛-inch or $\frac{3}{16}$-inch wire pieced together in the rear by a coil spring about 3 inches long, of same inside dimensions as wire used and into which the wire ends are inserted about ½ inch and firmly soldered. In front a locking device is made by bending one end of the wire to a three-quarter eye in a vertical plane, allowing the end to project horizontally; the other end being simply bent out horizontally.

Care should be taken to have the completed wire gap about ⅜ inch before locking. The locking itself is accomplished by half turn of a pair of pliers; or any block of wood with two holes drilled in its end

⅜ inch apart can be used as a key (for example, the end of a hammer handle).

The vertical locking device overcomes the bad open space between the criss-cross of the ordinary wire where flour or fine middlings is


COIL SPRING
SOLDERED PORTION
⅜" GAP FOR ORDINARY SPOUT STUB
HOOK IN VERTICAL PLANE
DRILLED HOLES TO RECEIVE WIRE ENDS
PERMANENT METAL KEY TO BE USED IN PLACE OF HAMMER OR PLIERS IF DESIRED
POSITION WHEN LOCKED

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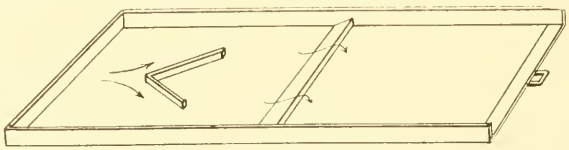
continually leaking through, and also enables the fastener to be drawn up tight with no slack and prevents sagging of the stocking.

SPREADER FOR SIFTER SIEVE

A *V*-shaped spreader made of light lumber and fastened on top of the sifter sieve will cause the stock, which has a tendency to form a



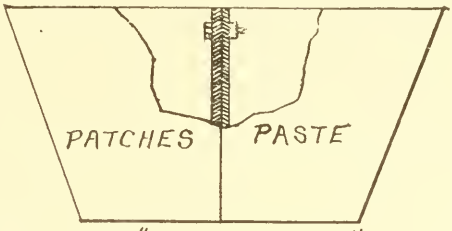
ridge in the center of the sieve, to spread to the sides and thus have a chance to bolt.

A ¾-inch piece of pine 2 inches wide, planed to a feather edge on one side, full ¾ inch on the other and reaching clear across the

sieve, will cause the stock to run over and assist greatly in the bolting. Both of these may be employed on the same sieve.

HANDY PATCH BOX

Take two small elevator cups and bolt them together, back to back, as shown in the drawing. Use one side for patches and the other side for paste. Use a small stick about the size of a sharpened lead



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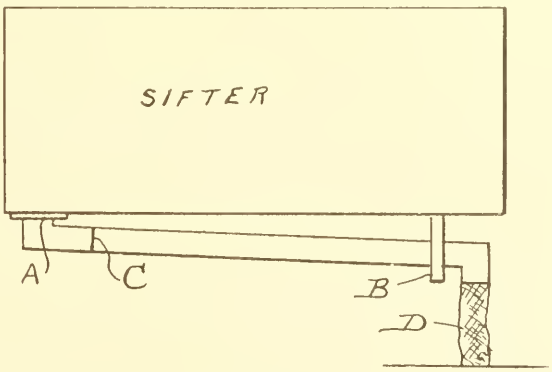
pencil. Make patches by folding old bolting cloth several times, then cutting with a No. 10 belt punch. This makes smooth round pieces of cloth with no corners for the reel brush to get hold of. With this outfit at hand the miller is always ready to take hold of the patching job without delay or inconvenience.

LEADING STOCK BELOW A SIFTER

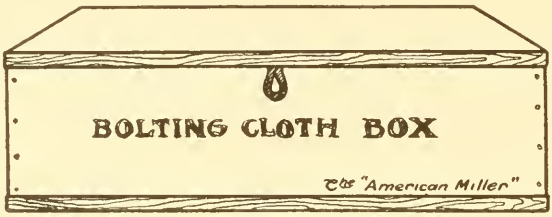
If it is desired to bring a certain stock down the opposite side of a sifter to which it naturally was coming, the sketch shows how it



can be done. Take a tin spout made with a flange at *A*, so it can be fastened to the sifter with small screws. At *B* work out a piece of board and insert the spout. The spout has a joint at *C*. The board at *B* is also screwed to sifter box. The stock enters the sleeve *D*.

PROTECTING BOLTING CLOTH FROM INSECTS

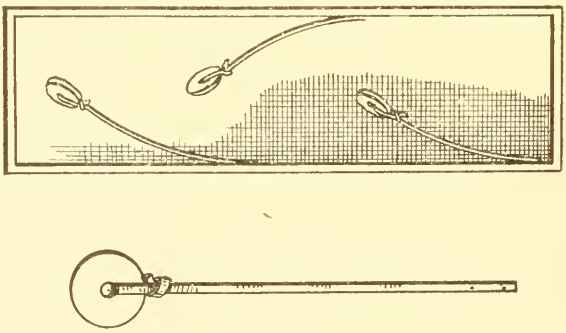
New bolting cloth should always be kept in good condition, free from dust and protected from ravages of insects. To do this, make a small box out of cedar lumber of sufficient length to hold the bolts



of cloth. Hinge the box, making sure of same fitting tightly, and when finished give the outside and more especially the inside, two coats of oil of cedar. The inside should have an application of this oil, which can be obtained at any drug store, every few months. It is best to use cedar, but any hard wood can be used if it is coated with the oil.

IMPROVED CIRCULATION FOR SIFTER

Sometimes it is found that one or more sieves of the sifter need more circulation than the rest will stand. This can be overcome very easily. Cut a round piece of belting about 1 inch in diameter

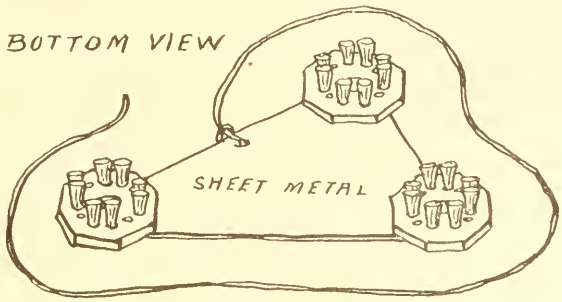


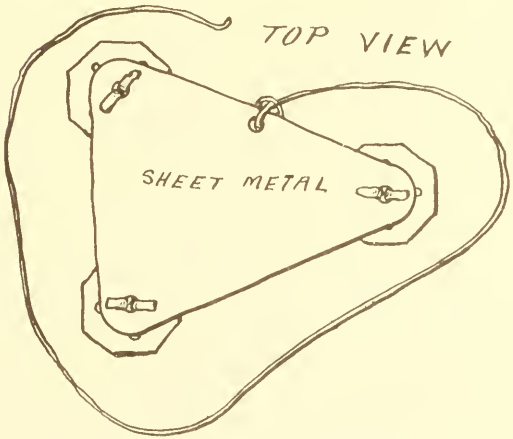
with a small hole in the center. Cut a piece of lace leather, about 12 inches long and tie a knot in one end. Draw it through the piece of belting and tack the unknotted end to the frame of the sieve on which you want to work, using more than one, if circumstances demand.

About three of these, scattered along the sieve are usually sufficient. They should be fastened so that they float with the stock.

CLEANER FOR SIFTER CLOTHS

Here is a sifter cloth cleaner that brushes the silk from the top instead of the bottom, one cleaner being used for each sieve. It is made of three ordinary sifter brush cleaners using a leather base.





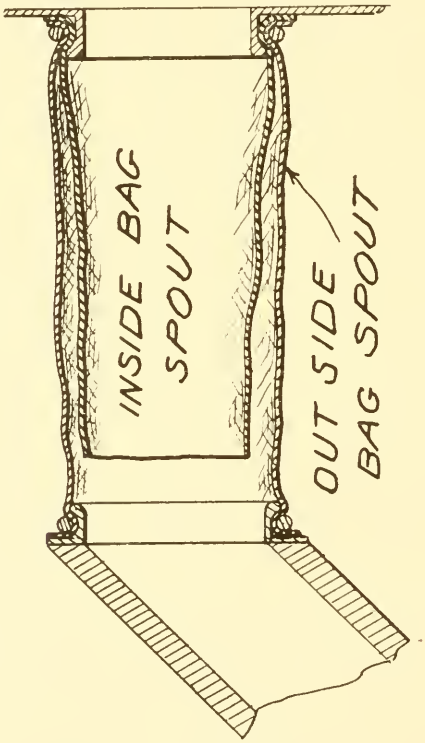
The metallic pieces clinched to the under side of the leathers are taken off and a flat, triangular-shaped piece of No. 24 galvanized iron substituted. A hole is drilled in the center of the leather disc and a corresponding hole in the iron, while a split rivet is used to fasten one to the other. The leather discs, however, must protrude a little from the rounded points of the triangle in order to protect the sides of the sieve frame. A thin strip of lace leather is fastened to a hole in the iron and the other end is fastened to a side of the sieve frame,

about the center, being long enough for cleaner to easily reach both ends of the sieve.

These cloth cleaners cannot turn over, measuring, as they do, from 4 to 6 inches from cleaner to cleaner, the galvanized iron being just heavy enough to have the necessary weight and yet not injure the cloth. This sifter cloth cleaner herein described will give greater satisfaction than any other. The coarse screens on the bottom of the sieves may be taken off, if desired, where these cleaners are used.

DOUBLE BAG SPOUT FOR SIFTERS

The idea of this device is to keep stockings from leaking through when they are cut through by the stock. The inner bag is not fastened at the bottom. This keeps the stock from accumulating



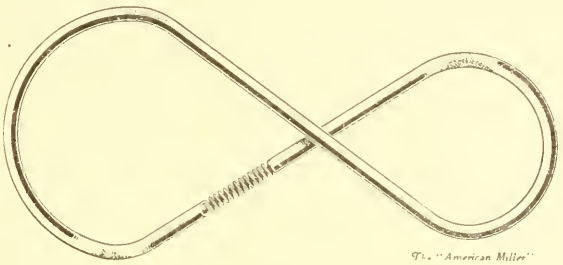
between the two. When both stockings are cut through, the inner one should be turned part way round. This can be done until the inner bag is completely worn out, the outside one still being as good as new.

CHAPTER VII

TRANSMISSION APPLIANCES

SPRING FOR SHORT BELTS

For short belts, where the life of the belt is short or the fastenings continually giving way, insert a coil spring of suitable size, as shown in the sketch. The spring should not be so long but that half of belt contact on smaller pulley will be leather. In some places, for



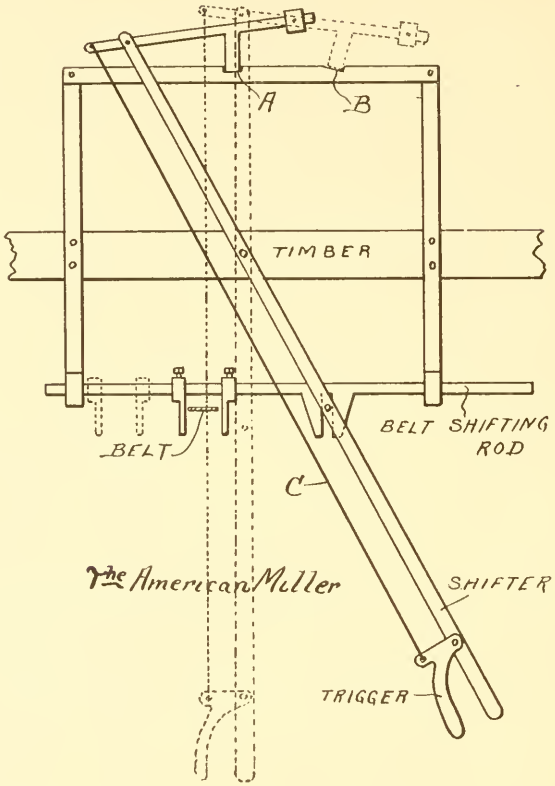
instance, roll feeders, short belts are a source of constant annoyance, causing frequent choke-ups. By inserting such a spring trouble is avoided. It can be applied to sewing machines or other places where short belts are used. It can also be applied to small flat belts by using two or small springs according to width of belt.

SAFETY BELT SHIFTER

Herewith is shown a drawing of a safety belt shifter which one can easily install. Safety devices have saved the hands and fingers of many men, and here is one that is highly satisfactory. It must, of course, be arranged for each case. In some places one can put the safety weight below the shifter rod, but this idea can be made to work with any belt shifter of any style the miller may happen to have about the plant.

Above the timber to which the shifter lever is attached a framework is built as shown. The lever is extended to carry a sort of a dog which has a weight at the outer end. This dog falls in slot *A* when machine is not running, and to shift the belt to the running position the dog must be raised by means of the handle on the shifter lever and the rod *C*. Slot *A* has parallel sides which prevent the lever from

shifting in either direction until the dog is raised. When the dog drops into slot *B*, the belt is in running position. One side of this slot



is cut at an angle so that the belt may be shifted in case of accident to the off position without the necessity of raising the dog.

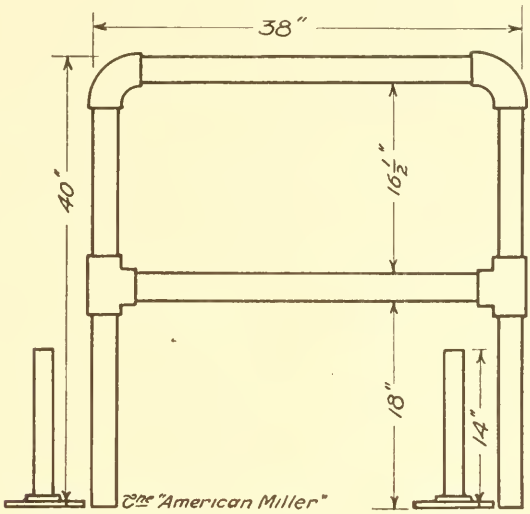
The shifter should be hung so that the lever is in a vertical position when the machine is running, so the weight will not move to the off position, due to jar of working machinery.

PULLEY GUARD

The roll pulleys and counter-shaft pulleys of a mill are especially hard to guard because the wheels must be removed frequently and this requires that the guard be torn apart so often that it gets rather rickety, and securing screws fail to take hold.

The drawing shows a guard, easily put together and made from

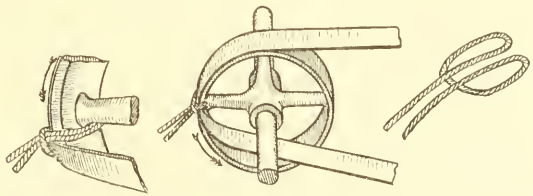
2½-inch pipe and two pieces of 2-inch pipe with flanges as supports. All measurements are shown on the drawing, but changes will have to be made for different size roll stands. The handiness of this guard



lies in the fact that it can be immediately removed, since the main part of it fits snugly down over the two 14-inch standards which are securely fastened to the floor. Thus the guard is merely lifted off the standards and one can work freely at the pulleys.

PUTTING BELTS ON PULLEYS

The illustration shows a method for putting large, high-tension belts on pulleys. Place the belt on the pulley as far as it will go easily.



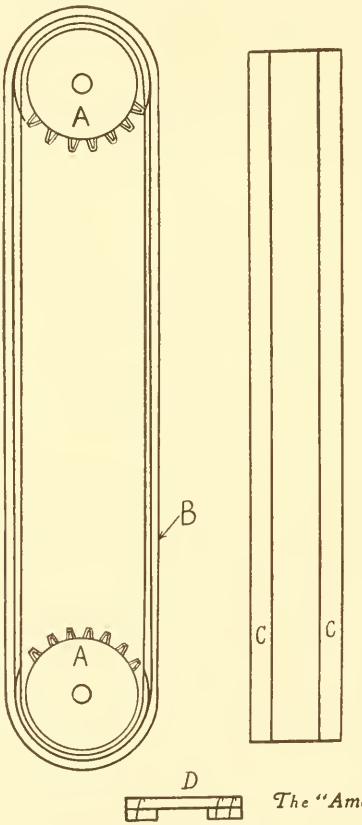
Then take a piece of rope, catch in the middle and bring the two ends together. Throw the loop around the pulley and belt in front of the spoke, as shown, and bring the ends through. Hold ends in the hand and give the slow start signal. The belt will be carried onto the pulley

easily. Then the hold on the rope is released, and the belt and spoke undo the loop without harm to belt or pulley.

Probably a little improvement is to tuck the ends of the rope under the fore part of the belt and draw them tight, instead of holding the ends of the rope with the hands. The ends will then stay without holding, and when the belt is on the rope will rip itself off as the ends come off first.

BELT ON SPROCKET WHEEL

In an emergency or for some special service for which there are no pulleys sprocket wheels may be used instead of pulleys. As shown



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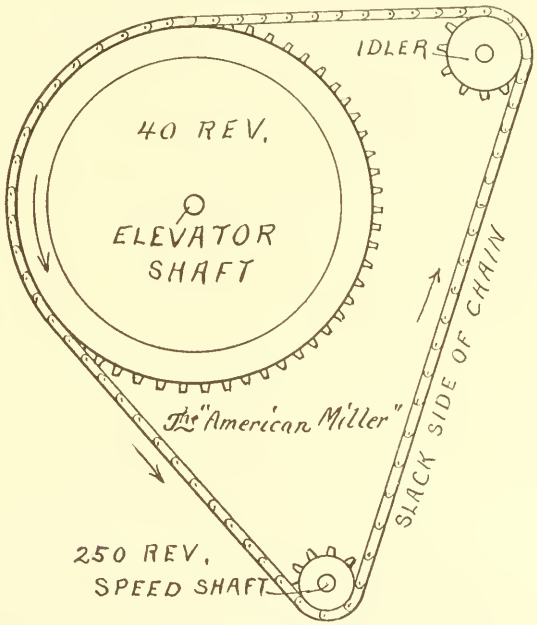
in the diagram *AA* are the sprockets; *B* the belt; *CC* narrow strips of leather tacked on each side of the belt leaving a groove in the center. This adds greatly to the strength of the belt without subtract-

ing any of its pulling power. A cross section of the belt is shown in *D*. This belt can be spliced and cemented or belt hooks can be used to fasten the ends together.

CURE FOR RIDING CHAIN

The accompanying sketch is a sure cure for riding chain on large sprocket driven from a high speed small sprocket. Engineers advise not to drive elevator shafts from a high speed shaft with chain and



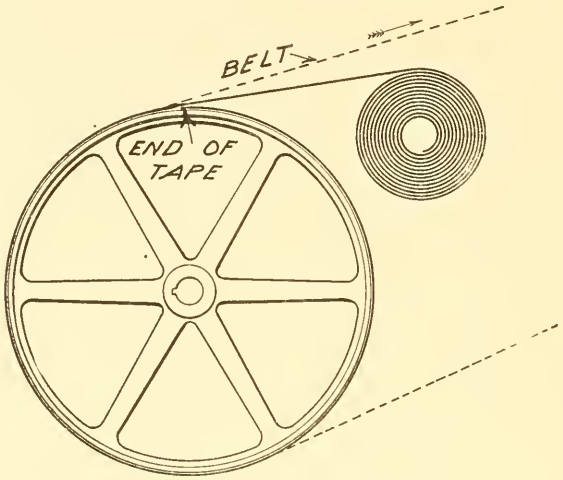
sprockets. They know it is an economical drive but too troublesome with two sprocket wheels, as ordinarily driven. With the third sprocket, as shown in the sketch, giving less wrap of the chain around the large wheel it makes a perfect and economical drive.

INSURING CORRECT BELT TRAVEL

The idea of this wrinkle is to make the belt travel on the center of the pulley whether the shafting is in alignment or not. The tape is wound on the center of the face, as shown in the sketch, making a crown to suit the requirements of the conditions under which the belt runs. Insulation tape, such as electricians use, that has a sticky rubber surface, can be used for this purpose, as it adheres to wood or iron

pulleys, making a permanent job and preventing the belt from slipping.

It often happens that when one wants to run a cross belt between short centers, from a large pulley to a small pulley, the belt will not run in the center of the small pulley. By making additional crown on the



center of the small or driven pulley with this tape the belt will run in the center of the pulleys.

This scheme can be used on the smallest or largest drives, and on the pulleys of elevators, preventing the belt from rubbing against the trunking and thus preventing fires.

A crowned pulley can be made from a straight-faced pulley in a few minutes at very little expense. All that is needed is that the face of the pulley should be thoroughly clean and the tape should be wound the same way the pulley runs, as shown in the sketch.

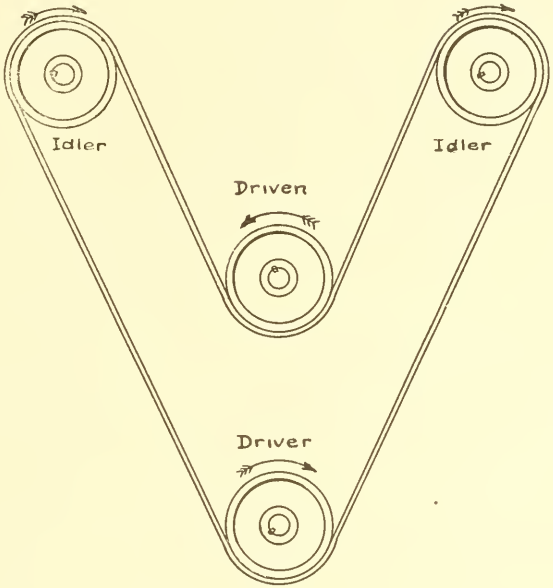
A USEFUL DRIVE

This drawing shows a device that will often come in handy when it is necessary to secure a reverse motion with a sprocket chain drive between short centers. The latter is a very practical drive where low speed is used, but good practice does not allow the chain to work as a crossed drive under 10-foot sprocket centers.

The idlers may be mounted on a short piece of hollow shafting, sawed off to the right length for sprocket and bolted to some convenient timber with a lag screw or bolt, large washers being placed at

both ends of the shaft. The latter you may be able to pick up from an old conveyor gudgeon or piping.

Small slow running chains are sometimes crossed in order to get proper running direction, but it is not practical except in rare instances



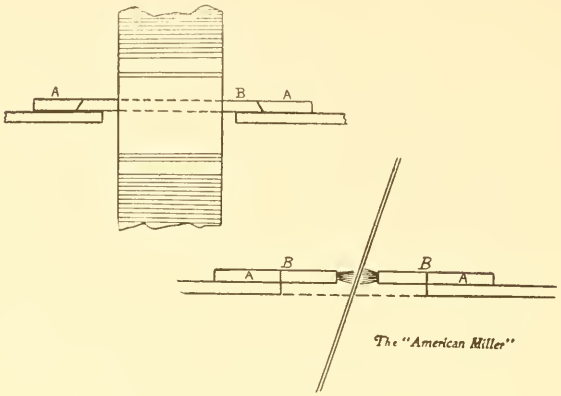
and anywhere this drive may be substituted, and used also in place of a crossed belt running at slow speed and short centers.

ADJUSTABLE BELT HOLE

Where the main upright belt is tightened by a horizontal idler, the belt hole in the floor on the slack side or the side the idler works on is often made as wide as the belt plus an inch clearance on each side and perhaps 2 feet long. This large hole is necessary so that the belt does not touch the side of the hole, for every notch that the idler is tightened makes the belt come through the hole in the floor in a slightly different place.

This unsightly belt hole may be remedied in a very simple way. Fig. 1 is a front view of the belt and Fig. 2 is an edge view of the belt. Beside the belt hole and perhaps an inch from it are fastened the guides *A-A*. Between these guides slide the boards *B-B*. Now when

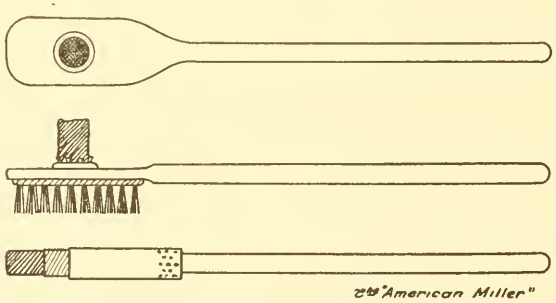
the belt is tightened to the right tension, slide the boards *B-B* in toward the belt till they leave just sufficient clearance and the belt hole is



practically the same size as an ordinary belt hole. It desired, a piece of old bran duster or similar brush can be fastened to the edge of the board nearest the belt to keep it as clean as possible.

APPLYING BELT DRESSING

Many serious accidents have resulted from the careless manner in which belt dressing has been applied. A safe way to apply dress-



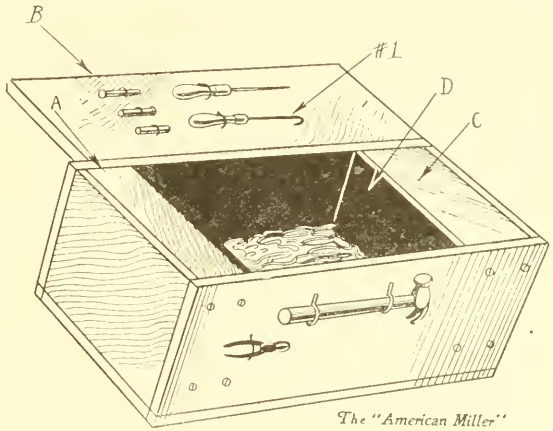
ing to a slipping belt is to take a 2-inch board about 2 feet long and 4 inches wide, bore a hole about 1½ inches from the end the size of the bar, which is usually 2 inches. This holder may be trimmed down on the opposite end for the handle. A brush may be fastened on one

side, and it is always a good idea to brush the belt before applying dressing.

Another way is to take a round piece of wood about 2 inches in diameter and 2 feet long and nail a piece of galvanized iron around one end, letting it stick out over the end of stick about 2 inches. This makes a good holder for the dressing.

BELT TOOL BOX

A box for holding belt tools is one of the handiest and most convenient contrivances ever placed in a mill. To make the box, cut two solid blocks of wood, *A* and *D*, screw the sides and bottom to them



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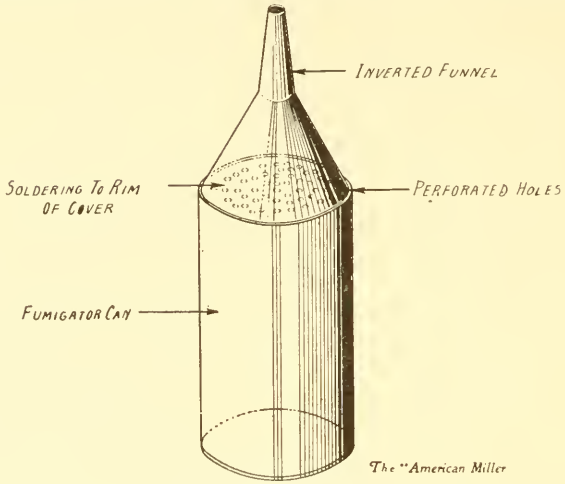
and put on the lid *B* with hinges. The block *D* should be cut down to permit a plate of iron *C* to be placed on it. This plate is used to clinch belt hooks, etc. Block *A* is used as a punch block for belts. A partition can be made in the box, if desired, one side holding belt laces and the other metal hooks. The tool in the lid marked 1 is simply a wooden handle with a piece of wire through it and a hook on the end of the wire. This is used for releasing the lace when it is not possible to do so with the fingers, as is very often the case.

BELT DRESSING CAN

For applying liquid belt dressing a very neat device can be made from a fumigator can or from any ordinary paint can. With a sharp punch perforate the cover with about ¼-inch holes all over the surface. Then invert over it a small funnel, soldering the funnel edge firmly all around to the rim of the cover as shown. The belt dressing is then

poured into the can and the cover pressed on securely. From this can the dressing flows in a thin, steady stream and can be zigzagged across

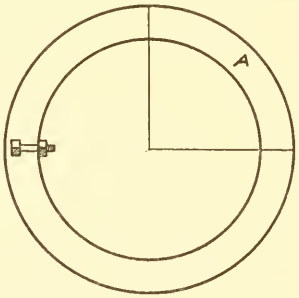


BELT DRESSING CAN

the belt when in motion, making even application. The can is easily and quickly filled, prevents leaking and waste, and keeps dust and dirt from the mixture.

PUTTING LAGGING ON PULLEYS

Sometimes it becomes necessary for a miller either to increase the diameter of a pulley or buy another one. A good way to increase the



size of a pulley from 5 to 12 inches is to drill holes in the face of the pulley, say about every eight inches, the exact distance varying with the size and speed of the pulley, placing them zigzag around the run.

Next describe a circle the size of the pulley and another a trifle larger than the pulley is to be when increased. Then draw two lines

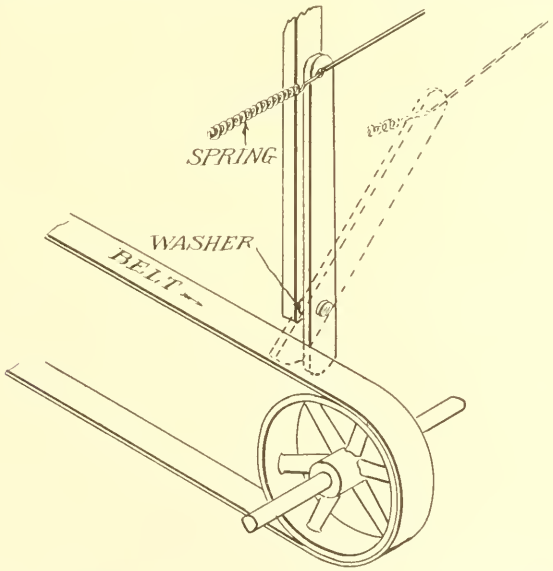
from the center of the pulley to the outside, and use the portion set off, as at *A* in the drawing, as a pattern for sawing out the pieces.

The latter can be made out of 7/8-inch board, using a hand or jig saw. After enough material has been sawed, lay the pulley down flat and place one round of the pieces around it, keeping them as tight against the pulley as possible. Then with screws and glue fasten the next round on top, breaking the joints, and keep on in this manner until the face is covered.

Bore holes to correspond with those on the inside and put in bolts, keeping all the nuts on the inside and countersinking the heads into the wood. Place the pulley on a shaft and turn the face to the proper size. If done with care, this will make a first-class job.

HANDY BELT SHIFTER

A belt shifter that can be operated from any floor in the mill, thus saving many steps when it is necessary to take off a belt several times a



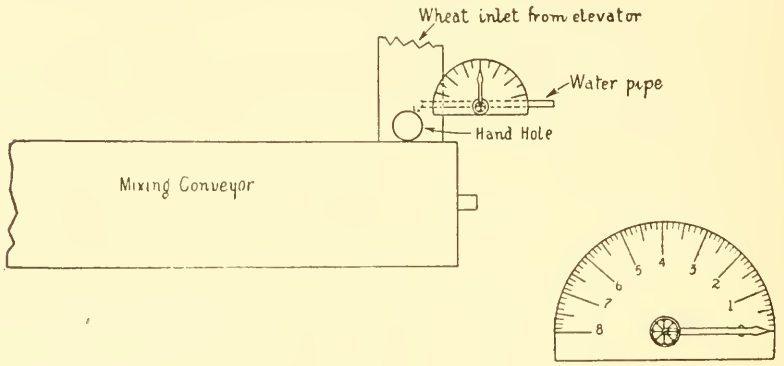
day, is shown in the accompanying sketch. It is made of two pieces of 2x4, one about 12 inches longer than the other, bolted together as shown. In putting the pieces together, put a thick washer between them to prevent binding. Fasten a spring on one side, to hold lever from the belt, and to the other side attach a rope, which can lead to any place in the mill.

CHAPTER VIII

BLENDING AND TEMPERING

VALVE FOR WATER IN TEMPERING

When there is no automatic tempering machine in the mill, a device for adjusting the water to suit the grain feed to the conveyor is found to be very useful. The one illustrated in the sketch is now being used



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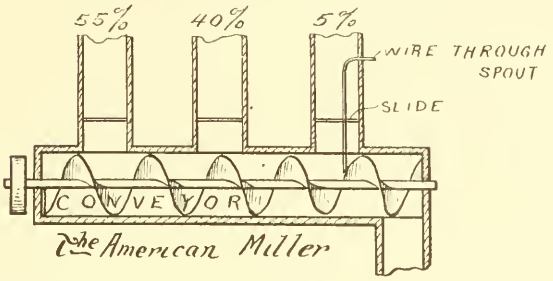
in a good-sized mill with great success. The tin hand on the dial indicates the amount of water going to the conveyor, the hand being fastened permanently to the cock or valve wheel when the hand is at 0 the water being turned off. An enlarged view of the dial is shown in the lower right hand corner, while its method of attachment is shown in the main part of the sketch.

BLENDING SMALL PERCENTAGES

Very often a miller has a parcel of off-grade wheat or corn left on his hands, which he has to work out as a small percentage of his run. To do this so that the percentage of off-grade keeps uniform in the feed is sometimes a task requiring much more time than circumstances warrant.

To save this time and labor, the device shown in the accompanying diagram was planned and it has been found to do all that was expected

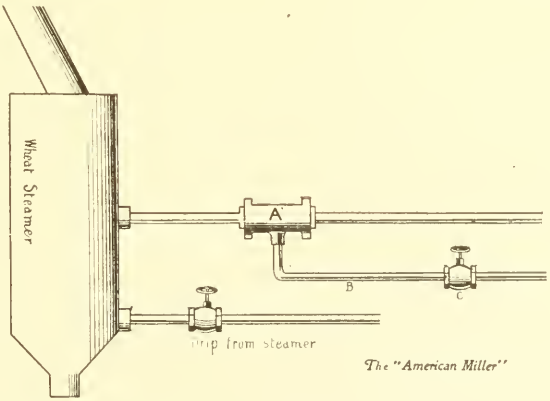
of it. Beside the two spouts leading to the blending conveyor a third spout is placed. In this spout is a slide through which a stiff wire



passes to keep it free. The wire, reaching down into the conveyor, is moved from side to side by the worm. This insures a constant though small stream of grain feeding to the conveyor.

OVERCOMING CONDENSATION IN TEMPERING

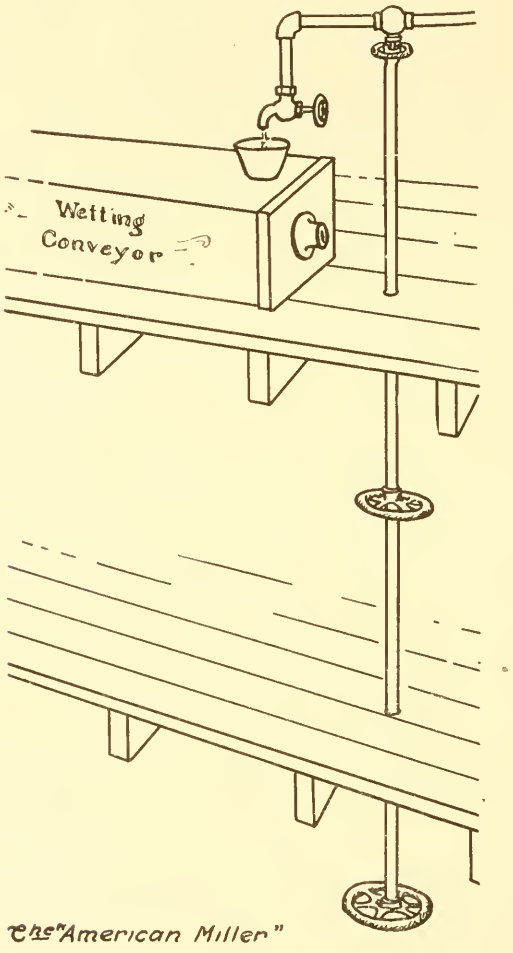
Very often steam to be used for tempering wheat is piped to a considerable distance to reach the wheat steamer. In this distance much of the steam becomes condensed and consequently there is some



water at the steamer to contend with. To overcome this trouble put a 2½-inch or 3-inch tee in the steam line at *A*, and a drip pipe therefrom as at *B*, containing a valve *C*. The large tee will catch the water and by occasionally opening the valve, *C*, to let the water out, the steam will be very much dryer. This is of great advantage in a steamer.

CUT-OFF FOR WETTING CONVEYOR

Assuming that the wheat dampening conveyor is located on the third, fourth, or any other story of a mill building remote from the grinding floor; when the wheat stops running, or the mill shuts down,



especially at an unexpected time, of course the water running to the wheat must be stopped at once. This may be accomplished if one will take the pipe from the water tanks and equip it with a valve ahead of the drip cock as shown in the drawing. The hand wheel is removed and a small pipe attached by means of a cotter pin, said pipe being

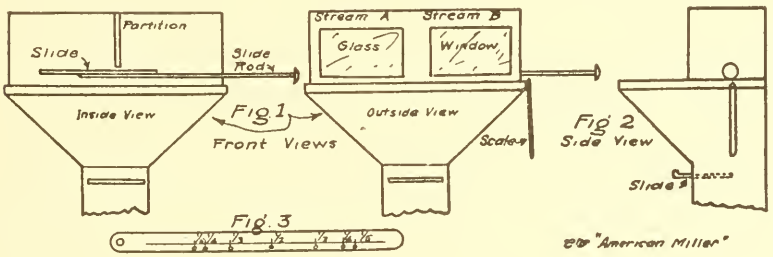
long enough to reach to the floor desired, and the wheel taken from the valve may be attached to lower end of the pipe.

By turning this pipe, the water may be shut off by anyone on any floor of the mill in case of sudden stoppage of wheat or shut down. It is also a convenience in starting and regulating water supply.

Should the wetting conveyor be located in the basement, the position of this device may be reversed, extending upwards through the different floors to be operated in the manner described.

WHEAT BLENDER WITH SCALE

This device is intended to blend two streams of wheat in any desired proportions. The interior of the blender is shown in Fig. 1. It consists of an oblong sheet iron box about twice as long as wide. As shown in the sketch it is made with a vertical partition through its center to keep the two streams separate. Near the bottom of the



box and about ¼ inch under the partition is a heavy sheet iron slide about an inch longer than half the length of the box. To the under side of the slide is soldered a $\frac{5}{16}$-inch iron rod extending through the end of the box. A small glass window is placed on each side of the partition to show at a glance how the wheat is running. A hopper emptying into a spout is placed just below the box. The top of the hopper is made to extend about 4 inches in front of the box to allow an examination of each stream of wheat as shown in Fig. 2.

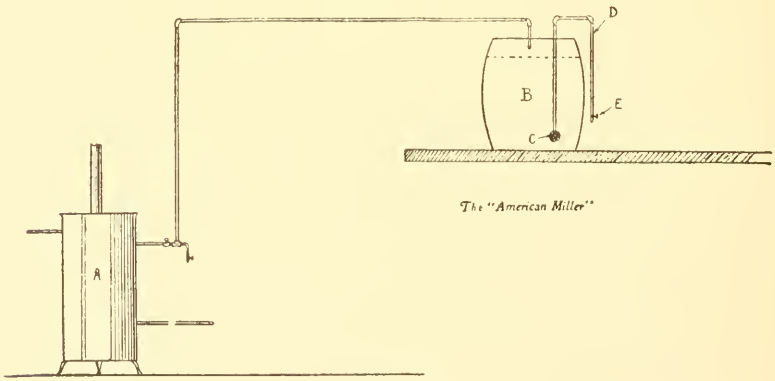
Since the position of the slide controls both streams of wheat at the same time, a scale showing the position of the slide, if properly made, will indicate the proportion of each stream of wheat constituting the mixture. This scale is made of a piece of thin metal and of proper length to extend somewhat beyond the end of the slide rod when the latter is fully withdrawn. It is well to bend a piece of heavy wire into the form of staple, pass it through a hole in the end of the scale and

solder one end of it to the side of the hopper. This allows the scale to hang out of the way when not in use.

To calibrate the scale proceed as follows: Nearly close the slide on the *A* side; have plenty of wheat in and above this side and have just enough in the *B* side to come to the bottom of the glass in this side. Then take a known weight of wheat—say 150 pounds, and place it in the bin above side *B*. Open the slide in the spout below the hopper and catch the mixture until the surface of wheat in side *B* falls to the bottom of the glass, then weigh the mixture. If the total weight is found to be 200 pounds, it shows that 50 pounds from side *A* have been mixed with the 150 pounds put into side *B*. In other words, one-fourth of the total mixture comes from the side *A*. Bring the scale to the horizontal position under the slide rod and mark "¼" on the scale just under the end of the rod. Other points on the scale may be found in the same way for different positions of the slide. If one is familiar with the use of cross section paper, the work of locating these points is greatly lessened. A suggested appearance of the finished scale is shown in Fig. 3.

SIPHON ARRANGEMENT FOR TEMPERING

For dampening wheat the following siphon device will be found efficient. Water is forced from the heater, *A*, in boiler room to tank,



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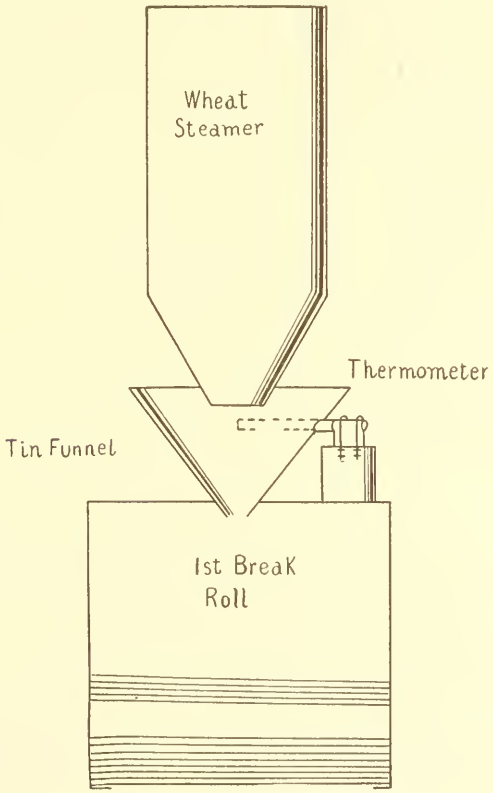
B, over dampening conveyor. When the tank is filled, a signal is sent to the engineer and the valves on the water pipe leading from the heater is closed. Water is taken from the tank by means of the siphon, *D*, to insure a perfectly even flow of water at all times. A regulating

valve, *E*, is placed on the end of the siphon over the conveyor. On the other siphon end, is a wire strainer, *C*, that will prevent anything but water entering the siphon.

THERMOMETER WITH STEAMER

The amount of steam going to the wheat steamer over the first roll is easily read by means of an ordinary dairy thermometer im-



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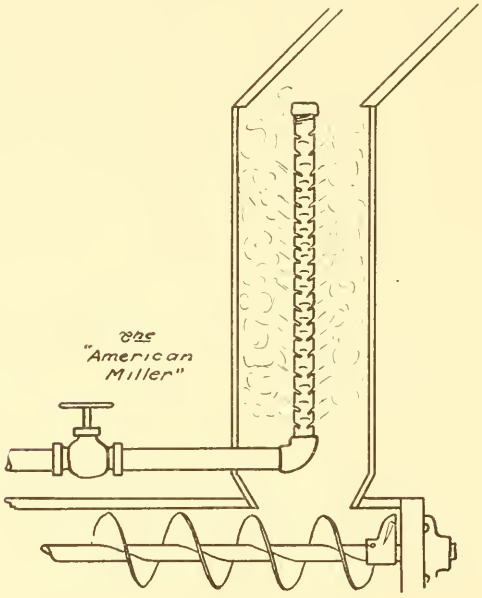
bedded in a strip of wood, this strip being made to slide on a block by means of two light guide strips of tin. The block of wood is then placed on top of the first break roll housing, so that the sliding strip with the thermometer may be slid in or out at will, through a hole in the funnel directly below a wheat steamer as shown in the drawing.

A steam regulator is attached to the steam pipe going to the steamer, hence only a needle valve regulation is necessary, and the amount to the steamer is instantly read by the thermometer.

WHEAT STEAMING DEVICE

An inexpensive and satisfactory home-made wheat steamer consists of a steam pipe, dead-ended and run into the center of a 4-inch pipe from the wheat spout, as shown in the diagram. This dead-ended



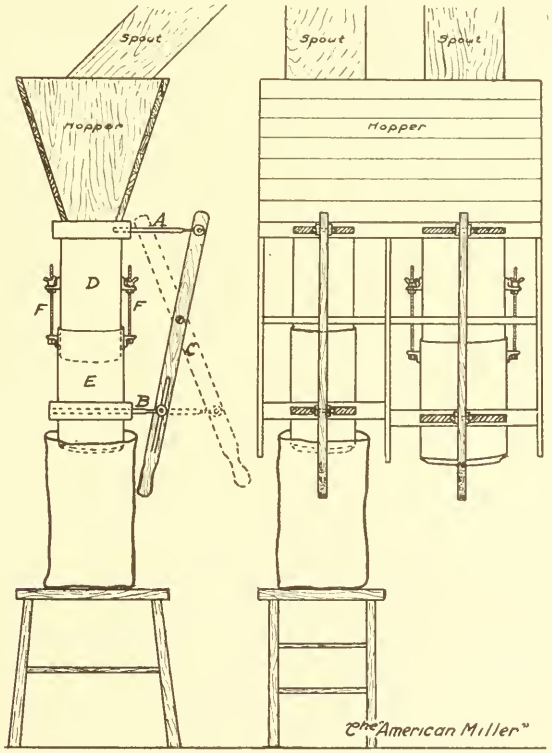
pipe has been slotted with a hack saw, inclining the slots to give the steam a flow counter to that of the wheat. The slots are well distributed and each berry in falling receives several streams of steam so that the process is quite thorough. The supply of steam is regulated by a valve external to the steamer. This device may be placed in between the wheat spout and the conveyor so that it discharges the tempered grain directly into the latter.

CHAPTER IX

FILLING AND PACKING

SACKING GRAINS

Quite a saving of labor is secured by a unique device used in putting up wheat or corn and their products in paper sacks. The application of the idea is original, although a similar piece of apparatus



was used on old-time powder-flasks. In the mill, putting up small packages, it is proving indispensable.

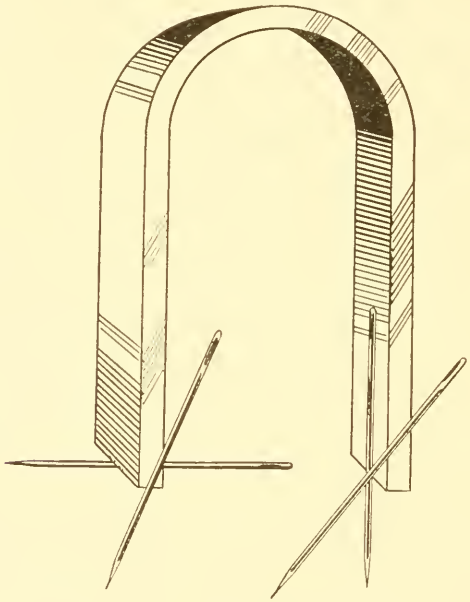
A sheet iron tube is used, large enough to hold a quarter or a half of a bushel, as the case may be. This contains a paddle or slide, one at the top and one at the bottom as *A* and *B*. These are operated by a pivoted lever, *C*, so that when one is closed the other is open.

The cylinder of tube, *DE,* is arranged to hold the exact measure between the paddles and can be regulated to the different conditions of the grain by bolts and lugs, *FF,* and the telescope tube, *E.*

This device can be arranged on a convenient post, underneath the sacking bin. Sizes of both a half and a quarter of a bushel are easily made, and to fill a bushel bag, the lever may be thrown twice.

MAGNET NEEDLE HOLDER

To make a good needle holder take an old magnet, such as is often used in the wheat spouts above the scourers, and fasten it to



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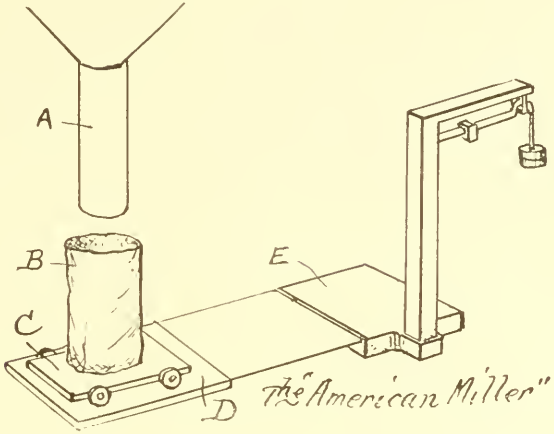
the top of the packer scales and no better needle holder could be desired. Just drop the needle on the magnet and it will not slip off. The accompanying sketch shows this magnet needle-holder.

SACKING ON TRUCKS

In a great many mills flour sacks are handled needlessly, which uses energy and time that might be put to better purposes. A simple device which will eliminate one, and perhaps more handlings of sacks, is easily put into use; *A* being the packer tube, *B* the sack of flour,

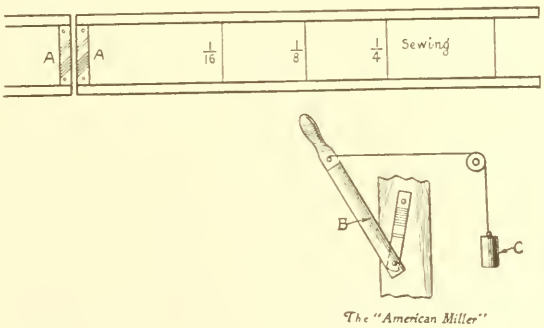
resting on truck, *C*. This truck is run over to the scale, *E*, weighed and tied ready for the storage. If the packer platform, *D*, has sup-



porting irons in the way they can easily be changed so as to permit the truck to pass. There should be two trucks so as to keep the packer going, and they should be of light construction.

ECONOMY WITH TWINE

With the amount of twine used in a flour mill, there certainly would be a great saving in a year's time if the tying or sewing strings



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were cut just the right length; also the package would look neater when finished.

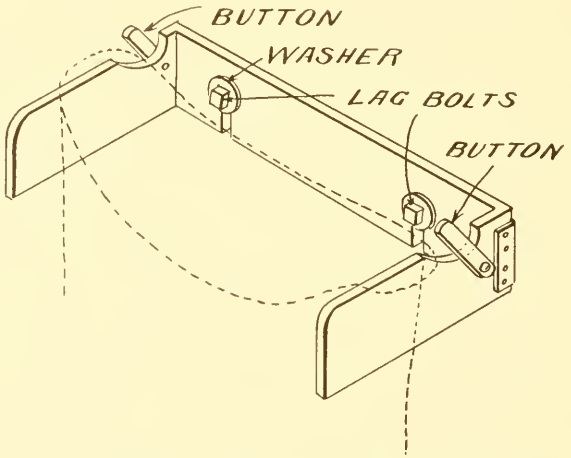
To cut twine with an ordinary pocket knife is a task, as the edge becomes dull after a very few cuts. The illustration shows a device for

cutting twine of proper length, the cutter being a file which will hold its edge for a long time.

Fix a board in front of knife like a mitre box, the strips on each side being not over an inch, or the height of the strand of twine. The length of the board should be six inches longer than the length of the twine used to sew with in the mill. On this board can be marked the different lengths of twine in daily use and they can thus be cut uniformly and without waste. The file cutter has one edge ground down in knife blade fashion and is fastened to the box and has a handle mounted as shown in the drawing. Its use will save much waste of time and material.

HOME-MADE SACK HOLDER

This "home-made" sack holder is an improvement over the average as it does not require any floor space, and it can be easily moved from place to place without tipping over. The sacks are easily put on and



easily removed when filled. If properly made, the sack will not come off until released.

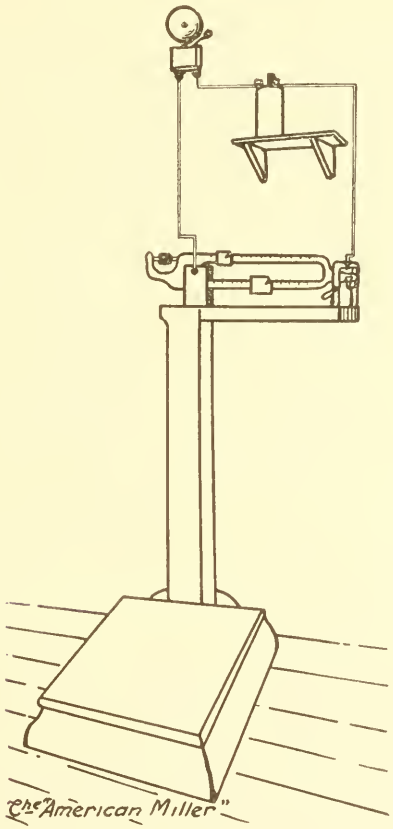
Small mills often have various kinds of feed in bulk in different parts of the mill. This must be scooped up from the floor as it is sold and there is not always someone at hand to hold sacks when needed.

This holder is made of inch lumber and fastens to the wall, or rather slips over two lag bolts which are provided with washers; thus it cannot get away. The sack is put in position as shown, the buttons

turned down and one is then ready for the scoop. The corners of this frame should be reinforced with angle iron. The dotted lines show the position of the sack.

PRACTICAL REMINDER

There are many times when workers get careless in the weighing of small bags, getting too much or too little, thus causing a waste or defrauding purchasers. If one has a little reminder, such as is sug-



gested in the sketch, it will keep the packer awake to his duties. With a little ingenuity, the attachment can be rigged up on any scale. The material needed is only a battery, a door bell and several feet of wire.

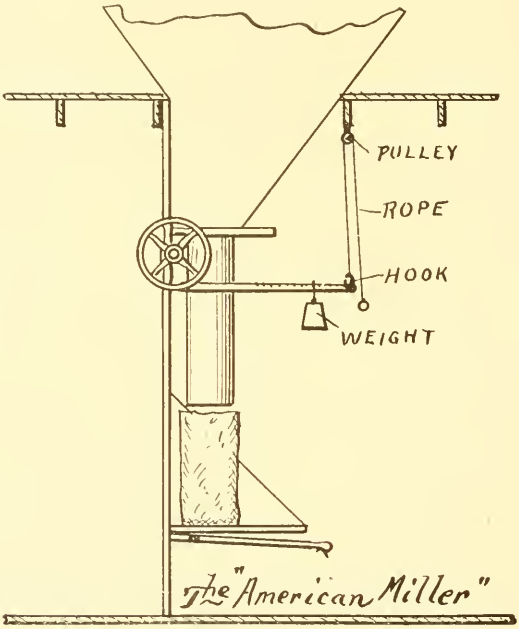
Several points must be considered. The wires to both contacts must not interfere with the weighing or alter the weight. If there is

any sparking at the contact, it would be well to place small extra pieces of metal at the places where sparking has occurred, to take the sparks thereafter, and adjust the weight at the end for the additional piece added to the beam.

It is suggested that one wire be attached on the immovable side of the knife edges holding the balancing beam and the other fastened to the retaining yoke on the end if that is insulated from the beam, or tied to it, if the beam is metallically connected to the yoke. The sound of the bell may be deadened so that only the packer can hear it plainly, thus avoiding unnecessary noise.

DEVICE FOR BRAN PACKER

Bore a hole through the weight lever of the bran packer. Attach a rope by means of a hook through this hole. Run rope over a pulley

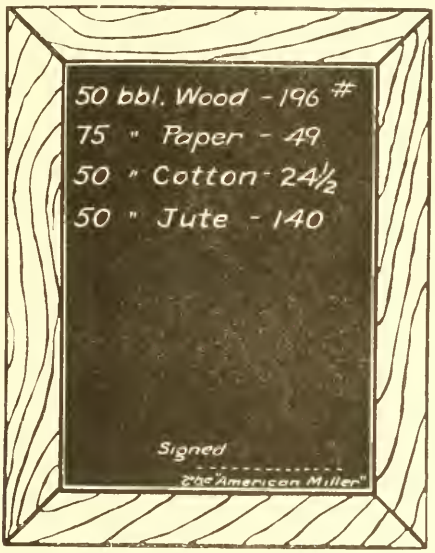


attached to the ceiling and back down to within easy reach of the operator. On the end of the rope tie a loop or attach a handle. This is much easier than having to lift up on the lever when running the carrier down to take off the filled bag, or when releasing the brake to run the platform up. All one has to do is to pull down on the rope and up goes the carrier.

BLACKBOARD FOR PACKERS

Verbal instructions are sometimes misunderstood in the packing room, and explanations of conditions take time to explain; but a blackboard places things in black and white and beyond dispute. The man in charge may give his orders to the packers on the board and any shipment got out is then checked off.

The blackboard is made up to a suitable size to permit of any desired usage. A few smooth boards in a frame and a little black paint

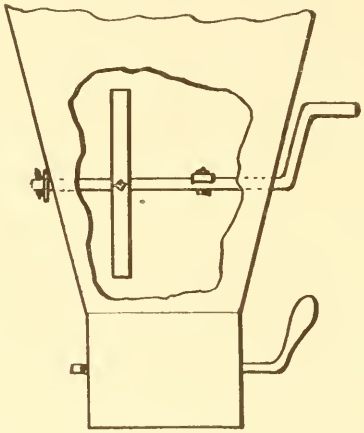


are the only requisites. When a packer at the finish of his trick has not the order all out, he chalks up the balance on the board as so many out, and so many to go. The next packer will continue with a definite idea of what has been accomplished and a lot of talk will be saved among the employes.

REEL FOR HAND PACKER

Often when a hand packer is pretty well filled with flour, and there has not been any taken out for some time, it will not run out very readily. At such times it generally becomes necessary to pound the packer with a mallet of some kind, and as a rule the wooden hopper becomes bruised more or less. The accompanying sketch on the next page illustrates a reel to overcome this difficulty.

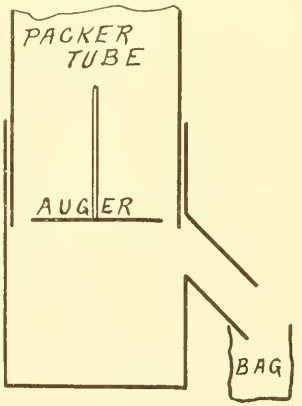
The reel consists of a 7/8-inch rod formed into a crank at one end, the other end having a washer and a split key inserted to keep the rod in its place. Two pieces of 1x1/4-inch iron, about 11 inches long, are



bolted to the rod with 1/4-inch bolts, the rod being filed flat where these irons are fitted to it. The two pieces of flat iron should stand at right angles, that is, while one is in a vertical position the other will be horizontal. A slight turn of this reel will generally start the flour. The reel must be placed as near to the bottom of the packer as possible.

PACKER ATTACHMENT FOR SMALL SACKS

This attachment will be found handy for use with a packer when

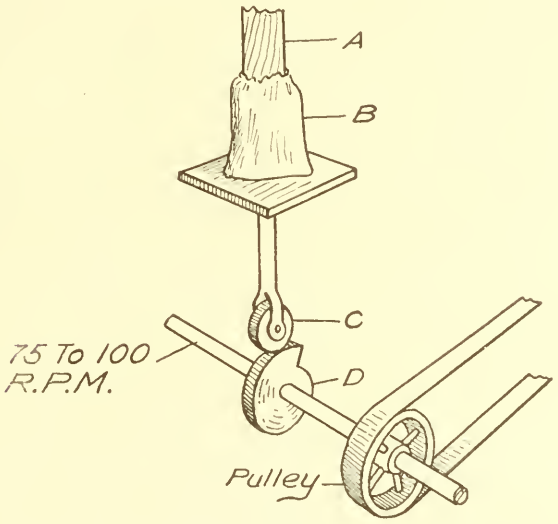


packing extra small sacks. The general outline of it is shown in the cut. It is made of galvanized iron with the spout in the side as indi-

cated. The bottom fills up as far as the spout and then the flour runs out into the bag held under it. With one man to pack and another to weigh, two men can fill a lot of sacks in a very short time with this attachment.

FILLING BAGS OF FEED

The accompanying sketch illustrates a labor-saving device which may be employed to advantage where there is a large amount of feed grinding or other material requiring thumping down to fill and pack



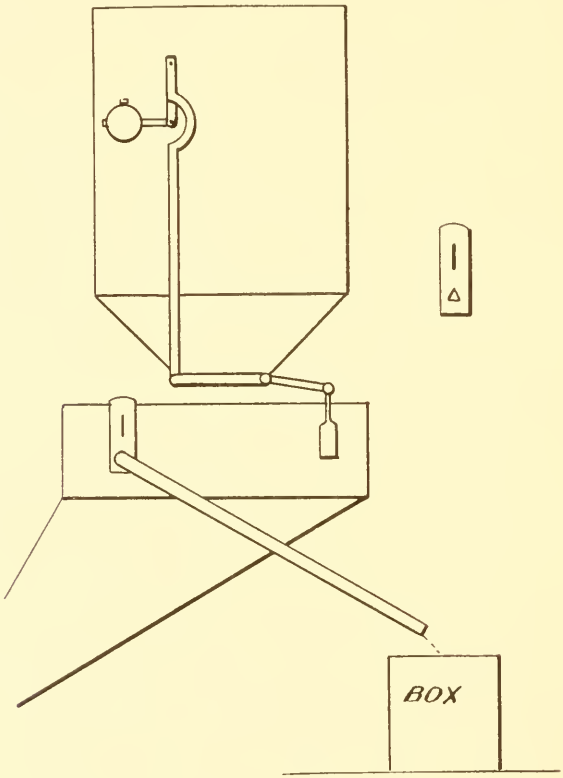
the bags properly. The sketch shows a driven shaft with pulley and cam, *D*, roller, *C*, with upright surmounted by a platform on which the bag, *B*, rests while filling from the spout, *A*. The cam, *D*, should have jaw clutch with lever or friction clutch to disengage the cam when not needed, and should have grease cup attached to prevent wear.

CHAPTER X

SAMPLING AND TESTING

GETTING AN AVERAGE SAMPLE

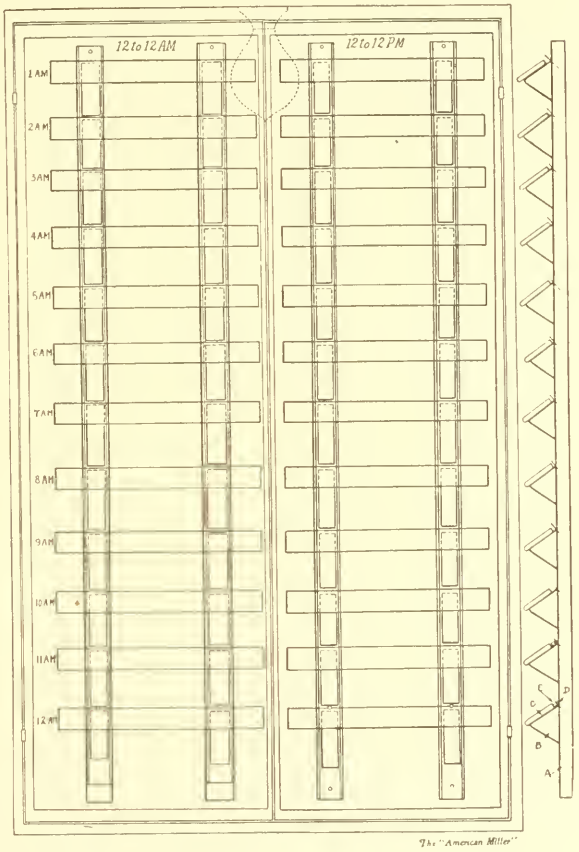
The sketch shows how to get an average sample of wheat from automatic scale or spout. Bore a 1-inch hole through side of spout and make a sheet-iron slide with like hole, also a slot in slide to regulate



same with bolt and thumb-screw. A small gas pipe or tin tube can be used to spout wheat to a box of sufficient size to hold enough to fill a grain tester and an absolutely average test of the day's run can be had. After once adjusting to get the desired amount, no further attention is required.

24-HOUR CABINET FOR WETTING TEST

The accompanying sketch shows a sample cabinet for the wetting test accommodating samples for each hour in a 24-hour run or two days when running on a 12-hour basis. The cabinet has a glass front



and electric lamp (several lamps can be used if desired). Besides furnishing light, the lamps help to warm and dry out the samples.

Referring to the side view shown at the right the construction details will be plainly seen. *A* is the wooden strip ⅞x1½x30 inches. *B* is one of the three-cornered blocks for the sample boards to rest on. These blocks are cut at such an agle that the samples are visible, but

flat enough that they will not slide off the boards when dry. *C* is one of the sample boards with screw-eyes *B* to hook over nails *E*.

All the boards should be made exactly the same size, so that they will be interchangeable and can be put on any block.

FILING SAMPLES OF GRAIN

In many localities farmers bring in samples of their wheat before they are ready to deliver it, on account of bad roads or press of other work, or because they think the price will be better later on. It pays to file these samples rather than merely to make a grade notation and the method illustrated answers the purpose admirably.

When the wheat sample is brought in put it in a pint or half-pint milk bottle that is clean and dry, sealing the cover so that it is airtight,

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and labeling the bottle with the farmer's name, the grade of the wheat and the amount he has to dispose of. Then, when the farmer calls up later to get a price on his wheat, the miller can go to the bottle and determine in a moment what it is worth. There is little chance for argument. The scheme has another advantage also: If the sample is clean, plump and unmixed with other grain, and the farmer knows that the miller has it, he will be much more likely to deliver grain that is up to the check than if there were no sample.

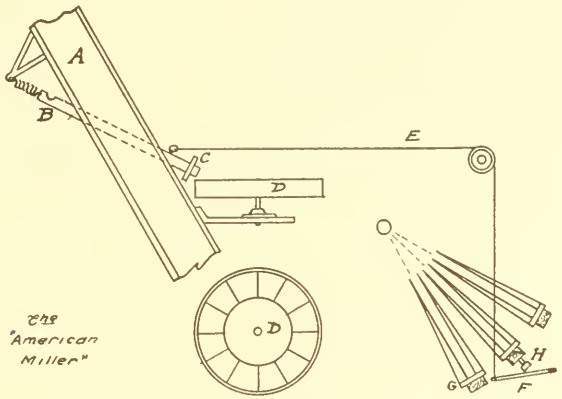
SELF-OPERATING SAMPLE CATCHER

Where it is necessary to take frequent samples, a good sample catcher is desirable. Here is one which will work anywhere: *A* is a spout or conveyor, *B* a piece of brass tubing, 1 inch in diameter. A hole is made in the end of this so that when the tube is pulled into the spout it catches a sample, which runs down through it and into a sample box, *D*. Now, to make this an automatic sampler, one must devise a method of pulling the tube, *B*, regularly into the spout and of turning the sample box also. These two things are accomplished in the following manner:

A hinged dog, *C*, turns the sample box, *D*, each time as the tube,

B, moves forward, *D's* motion being restricted to one direction of rotation; but its size may be unlimited. *E* is a wire which runs on little pulleys or direct from the dust collector to *B* and gives it its motion forward, being returned by a spring.

A small lever, *F*, which screw, *H*, pulls down as the dust collector drum revolves, is the prime mover. If the drum goes too fast, make a wheel with an extra long spoke to do the pulling down, so that it can



be arranged to take a sample for every four or five revolutions of the drum. The whole apparatus, or more especially the sample case, can easily be boxed and locked. An accurate and untampered specimen of the continuous flow or of the evenness of the blending is thus obtained.

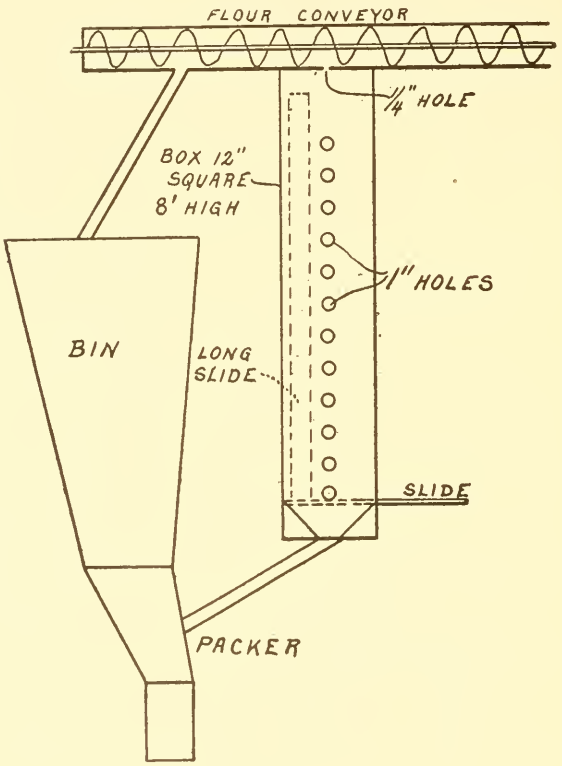
KEEPING TRACK OF THE NIGHT RUN

Make an upright box measuring about 12 inches square and 8 feet high, large enough to hold samples from a 12 or 14-hour run. Place this box under the flour conveyor carrying flour to the packer bin. Through the bottom lining of the conveyor a ¼-inch hole is drilled, the flights being arranged so that they will just touch the bottom at that point and prevent the hole from becoming clogged. With this arrangement there is a small stream of flour going to the sample cabinet all the time the mill runs. A number of 1-inch holes are bored in the cabinet as shown, with a long slide indicated by the dotted lines, to cover them while the box is filling. There is also a slide at the bottom for emptying the cabinet.

When leaving the mill in the evening close both slides, and the

cabinet gradually fills up during the night, so that in the morning a sample can be had of all the flour made on the night run.

In the morning open the long slide, take small half-round probe, get a sample from each hole, examine it for specks and compare it with



the standard. Should specks be found or if the flour is off color, note the hour on the cabinet at which it was made.

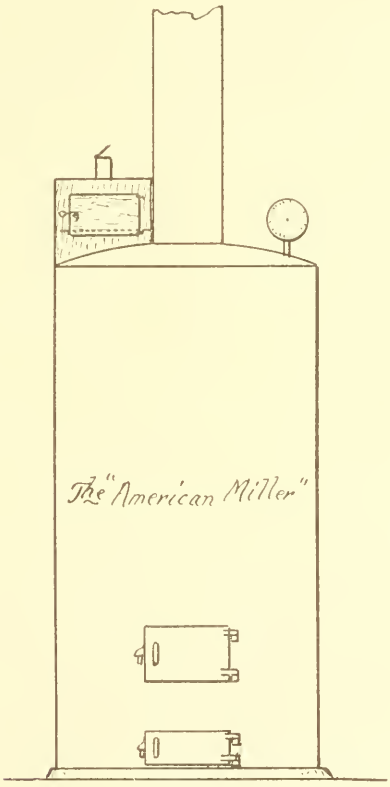
Then go to the warehouse where the flour is piled and marked according to the hour made, and sort out the off flour, which should be returned or redressed. Should the sample cabinet show a clean run, all the flour can be immediately shipped.

By this device it is not only possible to inspect all the flour made, but should the mill be shut down during the night it is possible to tell just how long the shut-down lasted. If, for instance, the cabinet

showed 11 hours instead of 12, there was an hour's shut-down. The small hole in the conveyor always runs the same amount of flour, regardless of the amount of feed on the mill, for there is always flour enough to cover it.

OVEN FOR SAMPLES

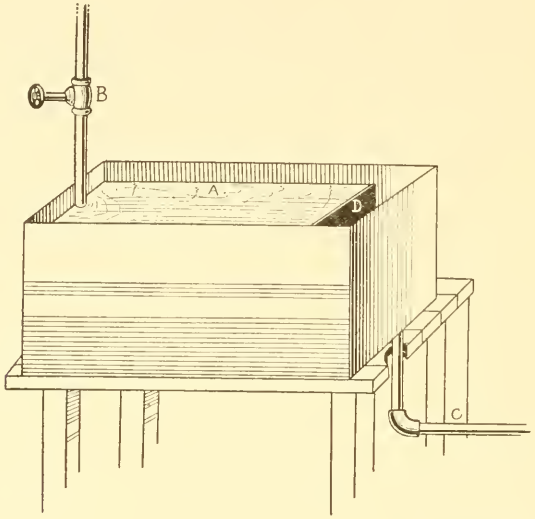
A baking outfit, so far as the oven is concerned, may be installed at little or no expense if planned like the one described here. It con-



sists of a tin box with a door and shelf in it, as shown in the cut, and is fastened to the stack of the boiler on top of the generator. The box has no bottom and sides are cut to fit closely to the generator top. The shelf in the box is made of iron. This little oven will bake the samples well and prove a convenient adjunct for the mill.

FOR THE DIPPING TEST

Where a pan or a bucket is used to dip samples of flour, fresh water has to be brought at frequent intervals or the sample will be dirty. To be sure of fresh, clean water at all times the following device is useful. Have the tinner make a tin box about 20 inches long by 14 inches wide and 10 inches deep. Two inches from the



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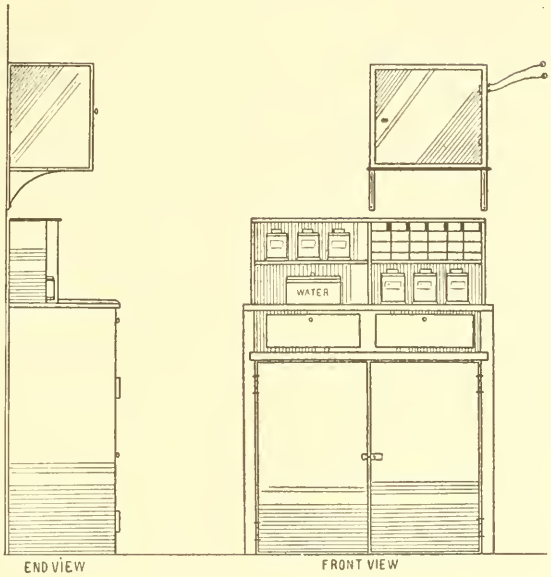
drainage end of the box put a partition which extends to within two inches of the top. See that it is well soldered. Connect a water pipe with a valve, *B*, as in the drawing, also the drain pipe *C*. Keep the water valve opened so that water will just slop over the partition, keeping the level as at *A*. It will take only a little water running to keep the box fresh at all times.

SAMPLE CABINET AND OVEN

The two views shown illustrate fairly well an arrangement for sampling flour mill runs. In the bottom of cabinet one may store the large standard samples. Then label coffee-cans, the working samples taken from the larger samples for convenience. Below the cans is the water in a covered butter jar. Above the cans on the right are 24 small pigeon holes for receiving each dipped and dried slide—one for each hour—above for p. m. run, below for a. m. run. On the brackets above is drying oven.

Just in front of water jar place a nice heavy pane of glass—use smooth moulding to hold it in place. It makes it easy to keep clean



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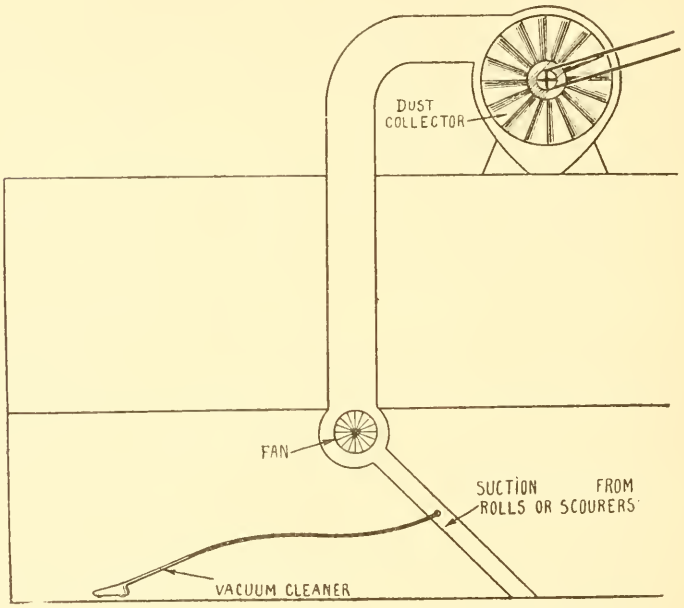
and the millers will not nick the woodwork when "knocking" trier. The drawer to the left is for waste. The one to right for a hand brush, slick, glass slides, etc. The cabinet should be of convenient working height and wide enough to suit individual purposes.

CHAPTER XI

DUST COLLECTION

VACUUM CLEANER

A vacuum cleaner can be easily installed in any mill. This will do the work thoroughly and easily, cleaning up dust, dirt, insects and so forth, without raising any dust in the mill. Simply get a piece of



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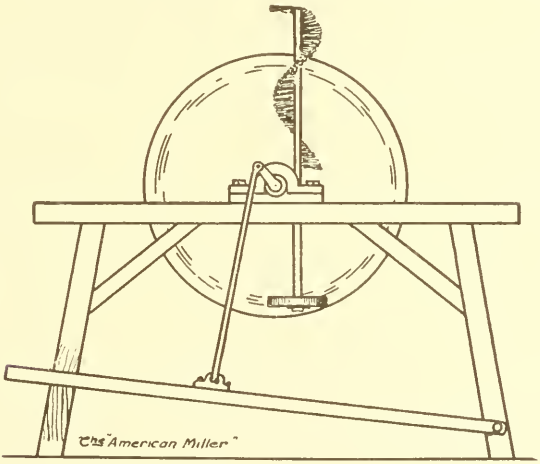
suction hose, such as is used with a large vacuum cleaner, whatever length may be required, also the attachment for collecting the dust used with the vacuum cleaner to move along the floor or any place that you wish to sweep. Then get a socket and attach this hose to any convenient suction trunk and the machine is complete. All that is necessary is to attach the socket to a suction trunk back of the fan. One or more can be placed on each floor. Have a cap to put on the

attachment when the hose is taken off to avoid the trunk taking in air when the cleaner is not in use.

If there is not a suction trunk available on certain floors, simply tap one on the floor above or the floor below and run a 2-inch pipe to the floor where it is needed. If the mill is large and the distance is too great from the suction spout to the farther parts of the mill, install a 2-inch pipe connected with the suction trunk and running lengthwise of the mill and have plugs placed at intervals along this pipe as required.

CLEANING DUST COLLECTOR TUBES

An easy way in which to thoroughly clean dust collector tubes or socks is with the use of a foot-power grindstone. For this purpose cut a broom handle to the right length, depending on the size of grind-

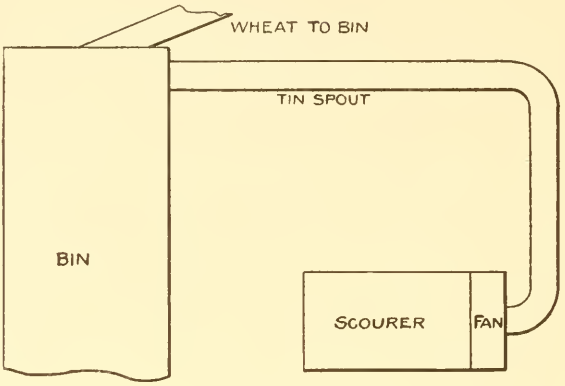


stone and length of collector sock. Put a small wooden pulley on one end made out of a 1-inch block which will probably be about 3 inches in diameter, facing it with a piece of leather lagging so as to give it a good friction edge.

Take an old brush; split it, and take the bristles out. By boring some holes in a spiral shape on the broom handle and gluing and fastening these bristles in we have a good brush to revolve as shown in the illustration. Now fasten the broomstick against the framework securely with a pipe cleat or two and by turning the stone, the brush will be made to buzz. Slip the socks down over the brush while in motion.

REMOVING DUST IN CLEANING WHEAT

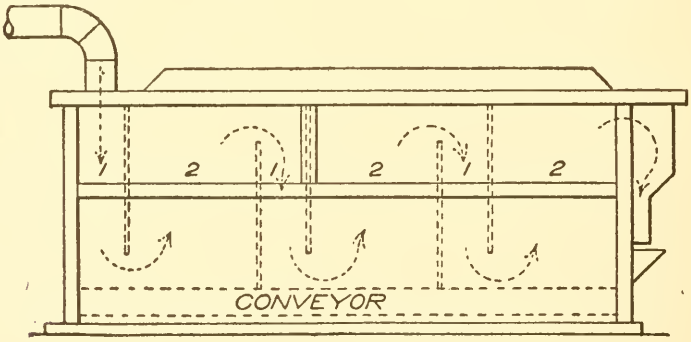
When cleaning wheat into wheat bin over rolls no doubt all millers have noticed more or less fine dust flying in the bin. Attach a tin



spout to the wheat bin near the top and then back to the fan on the scourer cleaning to the bin. This idea will prove successful in removing the fine dust.

PURIFIER CONVERTED INTO DUST COLLECTOR

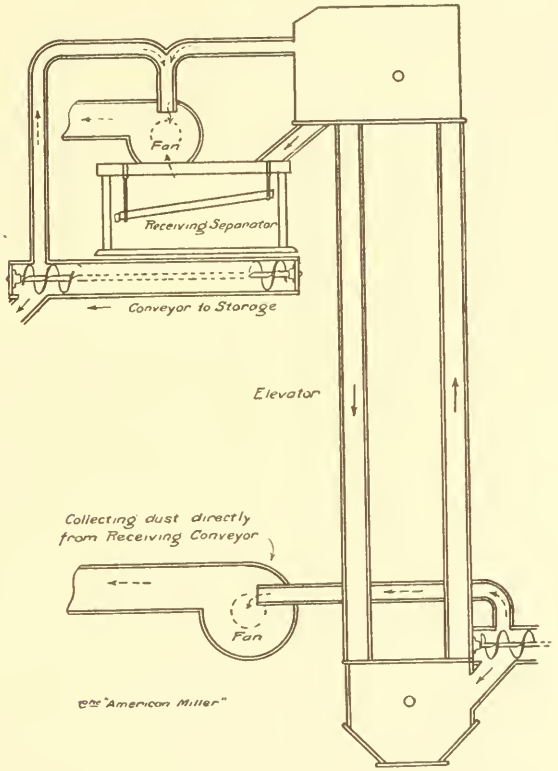
The accompanying sketch shows an excellent method of converting a purifier into a dust collector that will work well on any heavy



material. In making the necessary changes to convert the purifier it should be borne in mind that compartment *1* should be small and compartment *2* should be large, as the air will expand in the large compartment, allowing the dust to settle in the conveyor.

PROTECTION AGAINST GRAIN DUST

Of all the dust that is troublesome in the mill and elevator, the dust from the grain in the raw or as received from car or wagon is the worst. The dust which results from the ground grain is not injurious; it is the dust that adheres to the grain as it comes into the



mill that does the harm. To eliminate a great deal of this dust is an easy matter by means of the arrangement shown in the sketch. The wheat is received from the cars by an 8-inch conveyor. This conveyor discharges into the receiving elevator. As the wheat enters the elevator leg a spout is so placed that the air currents carry off the floating dust. The conveyor box is covered up except a small opening at the end furthest from the elevator; this opening admits the air.

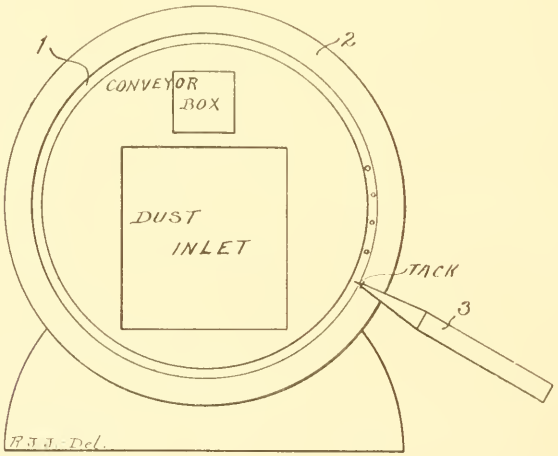
Now when the cups dump the grain into the spout that leads to

the receiving separator, there is considerable dust set free which is taken up by the air currents and carried to the separator fan. The wheat passes through the separator, drops into the conveyor, and again the air currents carry off the loose dust. The action of the conveyor sets free a lot of dust and if air is employed at the proper place a large amount of very undesirable foreign matter can be removed.

If, however, the elevator is not fed with a conveyor it will be well to attach a wind spout to the elevator leg just above the boot and in that way draw off a lot of dust. In many mills the large or receiving elevator is used for all the grain; in that case the arrangement here shown will be found very valuable. Where possible, run the air spout to the eye of the nearest fan, provided the fan is handling such stock as can be used in connection with the dust from the grain.

TACKING CLOTH ON DUST COLLECTORS

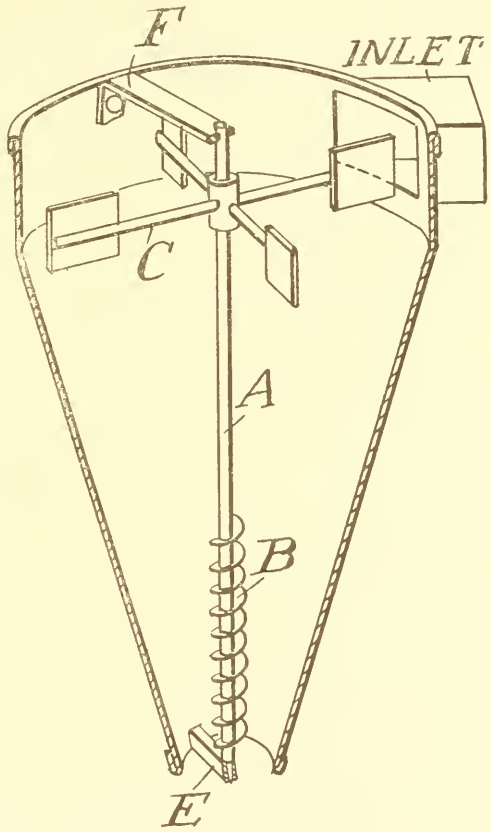
Replacing the bottom flannel on the ends of a tubular dust collector, to prevent the dust from escaping, is found to be a very tedious under-



taking because the wood circle is but ½ to ¾ of an inch in width. A casting projects 2 inches over this circle and it is difficult to procure a tack hammer small enough to fit this space. By using a magnet to magnetize a nail-set or a narrow piece of steel 3 or 4 inches in length, so as to hold the tack while it is being driven into place this objection can be overcome.

KEEPING CYCLONE DUST COLLECTOR OPEN

The accompanying illustration shows a sample way to keep the dust collector open. As indicated, *A*, is a round, straight stick 1 inch in diameter, with a pin in the bottom to go through *E*. A narrow strip



of iron, *F*, is the support at top. *C* is the cross-arm, with paddles on the end. There are two arms and four paddles, so the air from the fan runs it. *B* is a strip of tin cut from a round piece, tacked on so as to carry the stock down as the shaft is turned by the paddles and air.

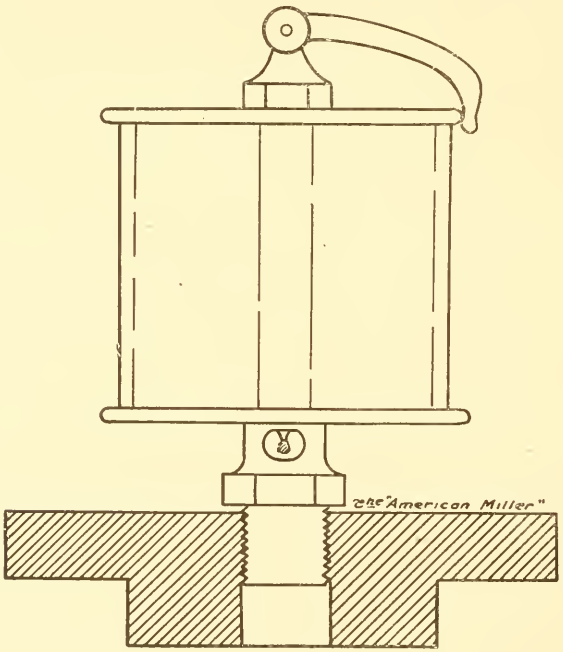
CHAPTER XII

LUBRICATION

HOT-BOX NURSE

This hot-box "nurse" is a great saver of time and oil and can be used wherever a journal box has an open-mouthed cap, designed to be filled with cotton, waste, or wool for oiling evenly. The "nurse" is set crosswise on the opening and becomes self-operative.

Boxes will frequently run hot, even with the best of care and apparently without a known cause. When hot, these journals require

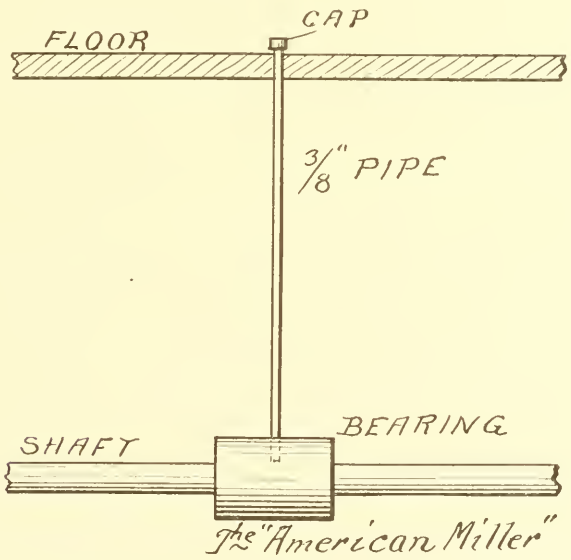


the close attention of some one of the help, who generally has to stay at the imperative point, leaving his other work until the box has cooled down to its normal temperature. This is not the case with the "nurse" on the job, for a continuous supply of oil is started on the journal and the temperature of it is reduced in a short time, with less waste of oil than if it had been poured on by the impatient helper.

The amount of the oil is regular and adjustable and the helper, after once setting the "nurse," which is no more or less than an ordinary sight feed lubricator set to run rather a heavy stream and mounted in a 7/8-inch board, can attend to his regular duties. The board is shaped so that it will rest on the bearing, the lower part fitting into the wool cap and keeping the lubricator and its stream playing properly on the shafting. With uniform bearings, this "nurse" may be used at any troublesome point at any time. The cam at the top shuts off the supply to the bearing when desired and thus the cup may be kept full and ready for application at all times.

"SAFETY FIRST" OILER

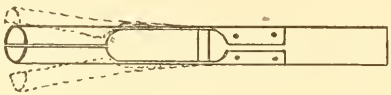
In almost all mills there are some bearings which are a continual source of danger for the oiler, particularly where the bearing is situated between two pulleys. A "safety first" method of providing



for dangerous bearings (such as those between pulleys) can be contrived by procuring a 3/8-inch iron pipe, boring a hole in the floor directly above the bearing and letting the pipe down so that the end rests just above the bearing. The upper end of the pipe should extend just above the floor and should be provided with a screw cap so as to protect it from dust. This can be unscrewed each day when the oiling is done, and the operator is never in danger.

TO CLEAN OUT OIL HOLES

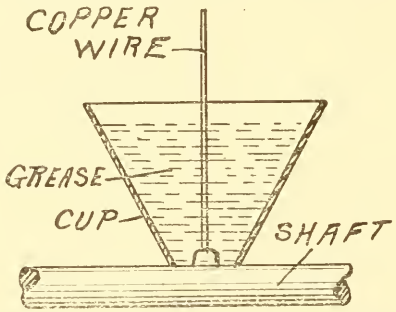
Take a piece of very thin steel, something like an eight-day clock spring, about 3 inches in length, and form the end so it will represent a half circle. Make two of these and fasten to a little wooden handle



so they will spread as shown in the dotted lines of the sketch, and when pressed together will form in the shape of a belt punch. Press the two springs together and shove down into the oil hole, hold in that position until withdrawn. They will bring out accumulation in the oil holes, which can be wiped off on a piece of waste.

A SIMPLE GREASE CUP

This grease cup can be easily made in any size, out of common tin. Through the center of the grease runs a copper wire, terminating in a flat head of the same material which rests on the shaft itself. When



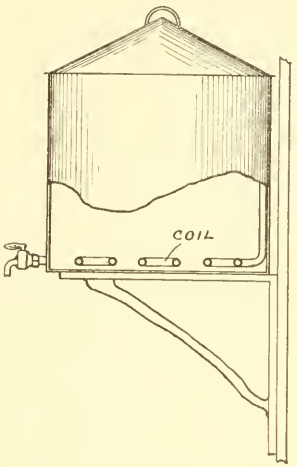
the bearing becomes warm the heat is transmitted to the copper wire, thereby melting the grease and automatically lubricating the bearing.

This cup should be used on bearings which cannot be oiled after the mill is started. Care should be taken to fill the cups before starting the mill. A cover of the same material as the sides can be easily applied to the cup.

HEATING THE OIL

This device is useful in an engine room where there is no central oil supply. It consists of a small can mounted on the wall with brackets, fitted with a top that is easily removable. The can should be large enough to hold a couple of gallons of oil. In the bottom of

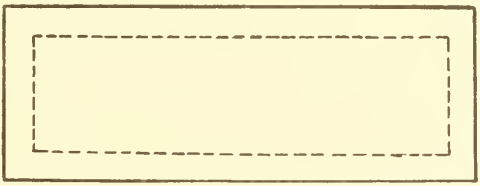
the can is placed a coil of pipe, made from short pieces of 3/8-inch pipe, ells and turns, which is connected to a steam line with a valve



so that steam can be run through the can to warm the oil. The oil is warmed up to the desired point and drawn. On cold days the device will be found quite handy, and will serve to keep the oil can off the engine cylinder.

GREASE OR OIL CATCHER

The cleaner mills usually have a drip pan to catch the grease and oil from those machines in the mill and engine room where there is



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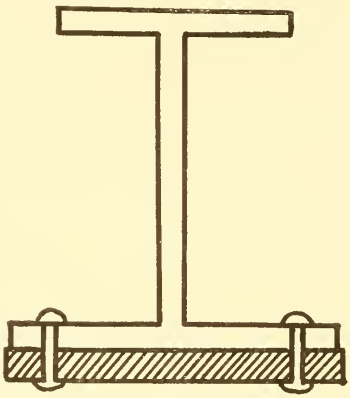
apt to be dripping. These pans can be made without the use of solder and yet be so constructed that they will not leak. Cut a piece of tin or light iron any shape desired. Cut it the width of the bottom, plus the height of the sides. Put it in an iron vise and bend it at

right angles along the dotted lines, as shown in the diagram. Let the corners go without bending until the ends and sides are bent, then put the corners in the vise or with a pair of pliers pinch the corners together, and bend around the sides as shown.

IMPROVING A GREASE CUP

It is very essential that grease cups used on sifters should be neat fitting where the plunger is screwed into the main part of the cup. As the rods are of some length, it takes considerable force to conduct



the grease into the sifter boxes. If the thread of the plunger does not fit closely into the thread in the cup, grease is forced up on top of the plunger instead of being conducted into the box.

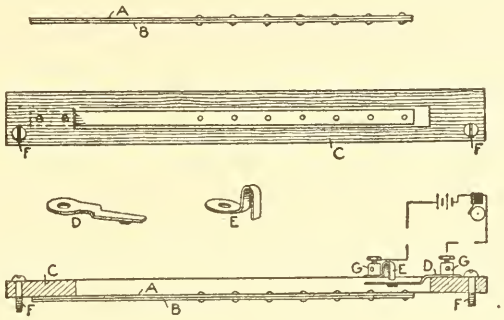
Such a cup can be satisfactorily remedied by boring three or four small holes through the plunger and riveting a piece of medium thick old belting against the bottom as shown in the cut. The leather is simply fastened to the plunger and afterwards cut to the proper size for a close fit. The improvement will be noticed immediately.

ALARM FOR A HOT BEARING

This hot bearing alarm consists of a device very similar to a thermostat. A tongue is made of a strip of copper, *A*, and a strip of zinc, *B*, both the same size and gauge, riveted together with small rivets. The tongue is fastened to the base, *C*, made of ¼-inch fiber similar to an organ reed. The slot in the fiber should be about ⅛ inch wider and ½ inch shorter than the tongue. Two screw holes, *F F*, are drilled in the fiber, as shown. The tongue is fastened to the base with the copper side in contact with the fiber. The electrical contacts

are made as shown at *D* and *E*. These contacts are attached to the fiber base with the binding-posts, *G G*. The circuit is wired as shown.

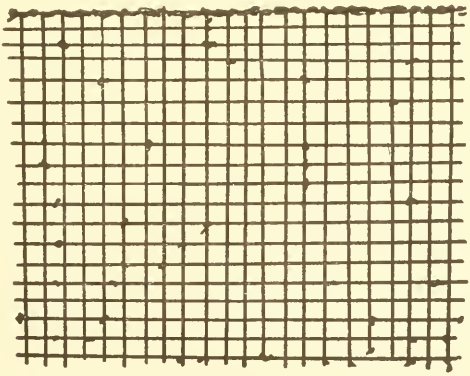
The action is as follows: The instrument is fastened flat on the bearing cap with the metal tongue in contact with its surface. If the



bearing gets warm, the zinc will expand much more than the copper strip, which causes the tongue to curl at the free end. In doing so it lifts the lever contact *D* into contact with *E*, thus closing the circuit and ringing a bell or lighting an electric light—whichever the miller may have installed.

OILER FOR LUBRICATING GREASE

Take a piece of burlap, just a small square of it will do, and draw



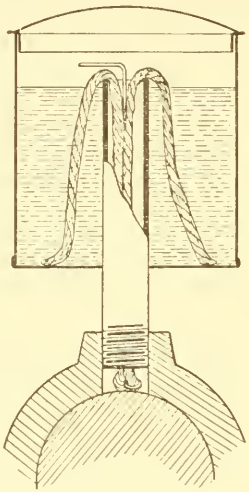
out every other thread; then get a lump of hard oil of proper size and drap it up in the burlap patch, putting the whole into the journal.

If one uses good hard oil or grease he will have little or no

trouble with hot bearings. The burlap patch will prevent the grease from running out of the bearing, as is often the case, and at the same time the grease will be at all times in contact with the shaft and performing its duty of lubrication.

HOME-MADE LUBRICATOR

Here is a simple home-made lubricator that will give good results. The cup consists of a little can with a hole in the center of the bottom.



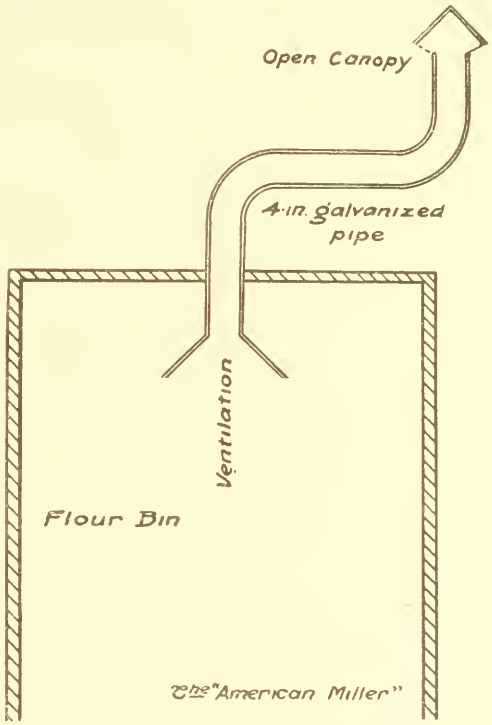
A piece of ⅜-inch pipe is soldered in as shown in the sketch. A thin wire with a double bag string for a wick is run through the pipe to the shaft. The cup is filled with oil level with the top of the pipe.

CHAPTER XIII

HEATING, VENTILATING AND FUMIGATING

VENTILATION IN BLEACHING

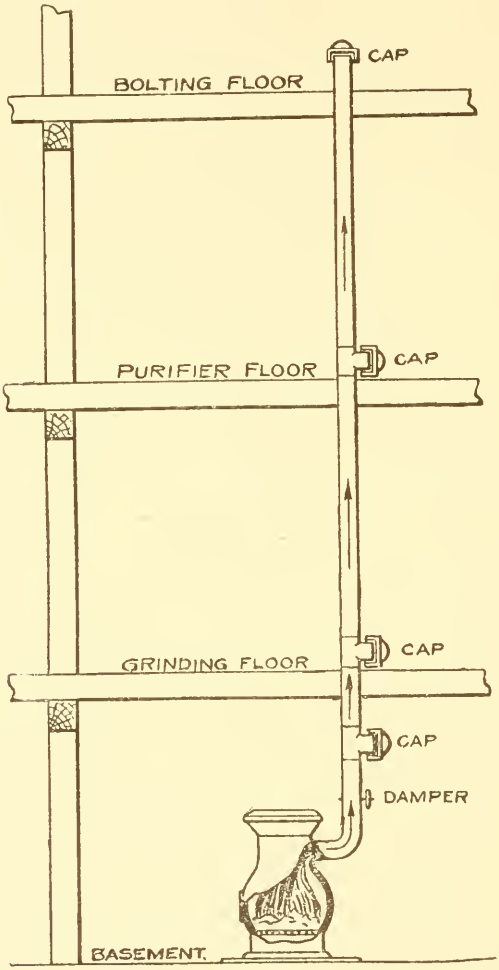
The following suggestion is made for those mills which use the bleaching process, although it might also be applicable in other mills where complaints of musty flour are reported. In the illustration a



good method of ventilation is shown, allowing the escape of the bleaching air from the bin to the packer and excluding and protecting from the rain and snow. The ventilating pipe is 4-inch galvanized iron and leads from the bin near the top to the outside, through the mill wall, into the fresh air. The canopy provided over the exposed end should be amply broad and deep, to keep out a driving rain, as it is not the object to get or maintain any big draft.

FUMIGATING SYSTEM

The following has proved to be a very satisfactory way of cleaning a mill and ridding it of the moth. Us a small cannon heating stove, about 24 inches high, with a 9-inch fire pot, connected with 5-inch



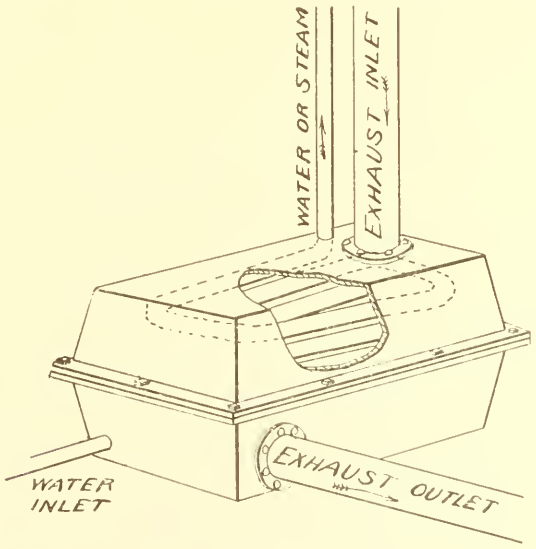
stovepipe extending from the stove on basement floor and up through various stories of the building, with galvanized receivers where pipe passes through floors, with tee just above each receiver. For precaution against fire, have the opening of tees covered with fine screen

wire; and over the openings put tight caps with handles. In the pipe, immediately above the stove, have a regular damper to regulate draft and also to keep fumigant from burning too fast or blazing.

In use the caps are first put over all outlets except the top. The smudge is started in the stove and continued until the upper floor is well filled with smoke. The cap is then put on the top and the tee opened in the next lower floor. The process is so continued until all floors are well fumigated, which requires but a few minutes for each floor. The operator has only the stove to look after and he need not inhale the fumes except while changing caps as outlined, as when it comes to fumigating the basement, all that is necessary is to pull the cap off and get out.

UTILIZING HEAT OF GAS ENGINE EXHAUST

The sketch shows a simple water heater or steam generator which utilizes the heat of the gas engine exhaust. A coil of copper tubing of



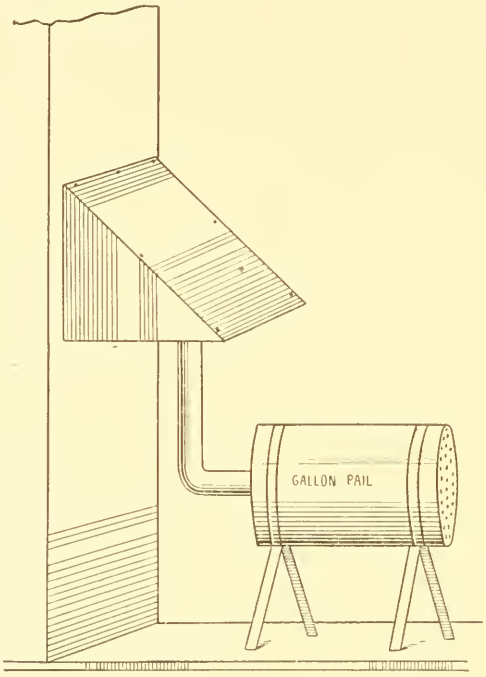
sufficient strength to stand the desired pressure is used. If running water is used for cooling, the water from cylinder jacket can be run through this coil and, by the use of pipes or radiators, the mill is heated considerably.

Six coils of ¾-inch copper tubing is sufficient for most mills. If you wish to make steam, a tank to stand pressure will be necessary

to hold the water supply. The amount of steam generated can be regulated by the amount of water allowed to enter the generator.

FUMIGATING WHILE RUNNING

It is difficult sometimes to find a time when elevator legs can be fumigated, if the mill is rarely shut down. Here is an idea designed



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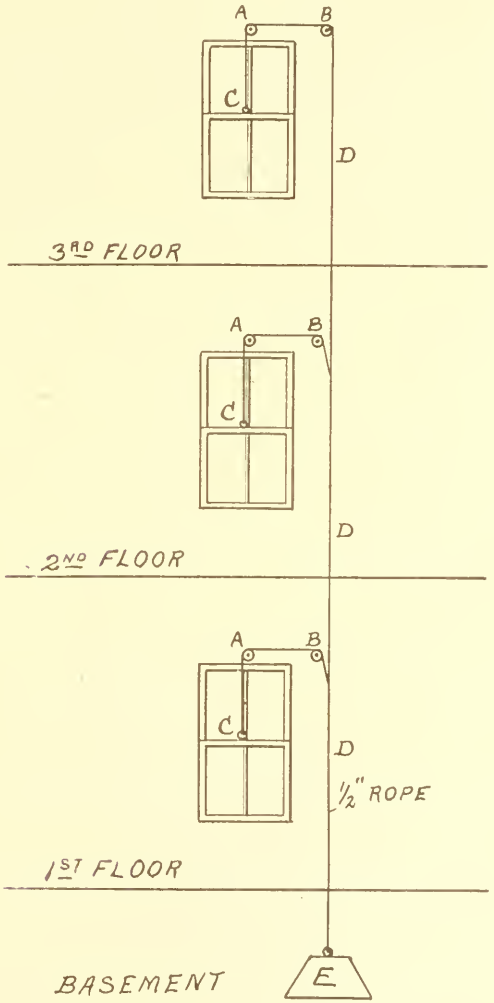
for such a case. An opening is made in the elevator to which fits a hood. The latter is connected by a pipe to a gallon pail containing the fumigant. The buckets in the elevator leg help to carry the vapor upward.

SIMULTANEOUS WINDOW OPENER

A simple way to open or close windows on two or three floors in a second is as follows: A ½-inch rope, *D*, passes up through the mill from the basement to the attic, being situated close to each row of windows. This rope passes through a small pulley, *B*, on the top floor, then passes through a small swivel pulley, *A*, situated at the top and

in the center of window casing. The rope is then connected to the screw-eye *C* in the lower sash of window.

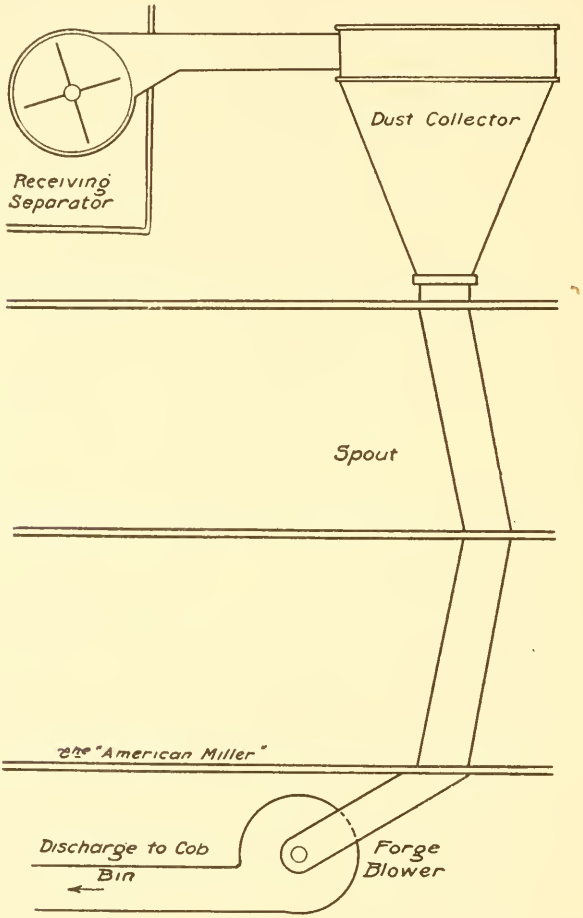
Short pieces of the same size of rope are then similarly attached to each of the lower window sashes and then connected to the rope *D*.



A weight made up of sand or an old gear, sufficiently heavy to balance the attached windows is then connected to the lower end of rope *D*, as shown at *E* in the basement. Another small pair of pulleys may be used on this rope in the basement to prevent the weight *E* from rubbing.

GETTING WEEVIL OUT OF THE MILL

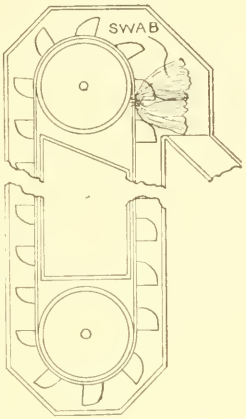
The object of this plan is to get the weevil out of the mill as quickly as possible, as it comes from the wheat unloaded from the farmers' wagons and elevated to the receiving separator. The flow is



self-explanatory, the separator fan blowing into a cyclone dust collector. This discharges into spouting which leads to a forge blower and thence cobs and straw are blown into the cob bin. The idea, if carried out, will surely get the weevil and keep things cleaned out generally.

CLEANING ELEVATORS BEFORE FUMIGATING

To clean the elevator before fumigating, take three or four wheat sacks, double and lay them across the top of the elevator cup at the top

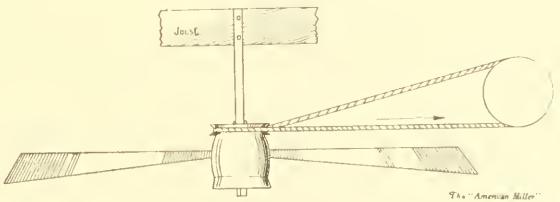


of the elevator. Then take a cord, wrap it once around the elevator belt, under the bucket and over the sacks and make it fast.

Loosen the set screw in the pulley and turn pulley backwards, drawing the swab down one leg and up the other a few times, which will clean them out as good as new. This saves all the trouble of taking off the belt and does better work in a fourth of the time.

COOLING FAN

The sketch shows, not an electric fan, but one which acts much the same. The hub of this fan may be a buggy wheel hub with part



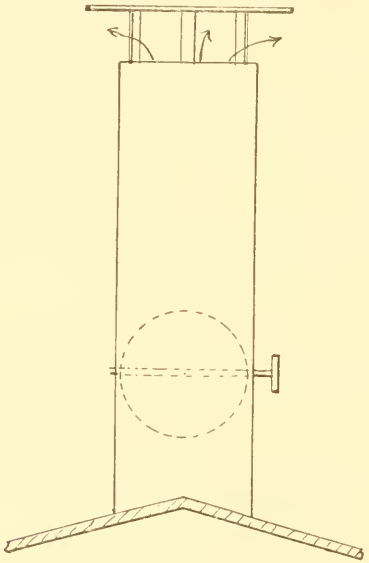
of the axle used for a support bolted to overhead joist. Two blades on the fans are sufficient, each three feet long and tapered to one inch at hub, the outer end from three to four inches wide. The blades of the fan should be set at an angle so they will stir up the air. The speed of the fan should run from 70 to 80 revolutions.

In the most cases the fan should be located in the neighborhood

of the flour packer, as it is here where the most need for a cooler will be; this may, of course, be arranged to suit each individual case. This fan may be driven from any suitable shaft. The horizontal packer shaft will do—it may be driven by belt or rope. The expense of installing this fan is but very small, in fact nothing in many cases, but the benefit is quite large in most or all cases. Air set in motion is better than dead air. This fan if properly put up will have its effect on the entire floor of a small building. Two or more fans will take care of greater areas.

MILL VENTILATOR

Any tinner can make this style of ventilator and it is easy for anyone to put it up himself. Put up one every 10 feet at the highest



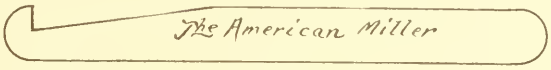
point in your roof. The tube should be at least 8 inches in diameter. The air in the mill will be noticeably better after these ventilators are installed.

CHAPTER XIV

SPECIAL TOOLS AND DEVICES

FIRST BREAK FEEDER CLEANER

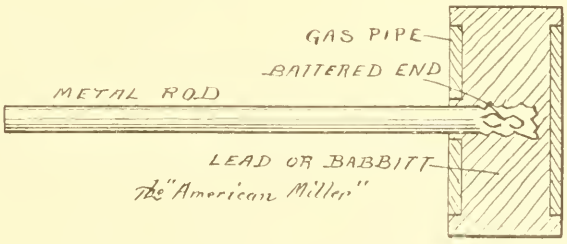
When the first break feeder is of the stationary variety, it sometimes happens that foreign substances get in and are difficult to remove.



Take a piece of hoop iron 1 inch wide and about 6 inches long and file a hook at one end. This simple little device will be found useful in such an emergency.

SOFT METAL HAMMER

A simple lead hammer should be used for driving delicate pieces that might be scratched or battered where a hard steel hammer is used. Just take a common piece of pipe of the desired length and diameter and bore a hole into one side just a trifle larger than the rod that is



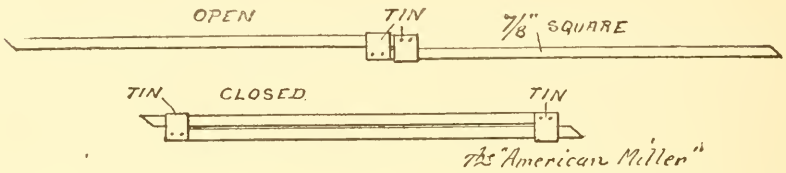
to be used as a handle, as indicated in the sketch. Batter the "inside end" of the handle as shown, so that it will be held securely by the soft metal.

The building of the moulds for pouring the babbitt is simple. Anybody can do it. Then, after the moulds are all fixed, the handle in place, and the lead molten, do the pouring stunt. The result will be a good serviceable hammer. Be sure to have the soft metal project well over the edges of the pipe as shown, so that the pipe will never strike

the driven object. As soon as the hammer faces are battered badly, the lead can be remelted and recast, thus making a "perpetual" hammer.

SLIP-POLE FOR MILLERS

Where measuring of long units has to be done, such as belts, spouts, etc., it is often inconvenient to have only a fold rule, particularly where measurements from the ceiling have to be taken. A slip-



pole is handy to have at such times, and as it is very easily made should be ready to use in every mill when needed.

The materials needed are two strips of 7/8-inch square poplar and two pieces of tin, 2 inches wide and 4⅜ inches long. The tin should be bent in a vise and the corners made perfectly square so the strips can slip through easily. The strips can be from 3 to 6 feet long.

REMOVING DOUGH FROM SUCTION PIPES

A useful tool to have about the mill is made in the following manner: A piece of tin or sheet iron is taken, which may be originally 3½x6 inches. At one end it is trimmed until it is judged to be about

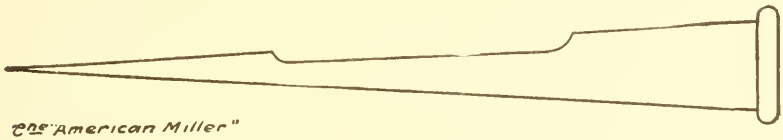
right to wrap half way around a broom handle. The other end is then bent until it fits in general the curvature of the pipes. It is now fastened securely by nailing on to a broom-stick, thus permitting quite a reach and scraping distance inside the suction system.

ROPE SPLICING TOOL

The hollow awl for rope splicing shown in the accompanying drawing is 9 inches long and about 1 inch in diameter at the large end. From the point the awl is solid for 2 inches and is then hollowed out,

as shown, for convenience in handling. In using a solid awl, the trouble is that when an opening is made in the rope for small strands, that have to be tucked in, and then the awl is withdrawn, the opening closes up before the strands can be inserted.

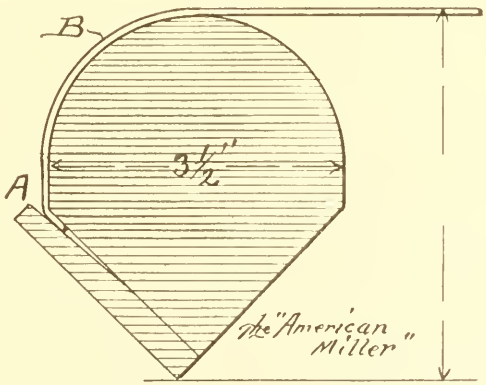
The hollow awl under these conditions will work to perfection, since, after the awl is inserted between the large strands, the small



strands to be tucked in are shoved through the opening made by twisting the awl and its groove. One hand now catches the small strand ends while the other untwists and withdraws the awl. The groove is 4½ inches long and runs about ⅜ inch wide on small end to ⅝ inch on the larger or butt end. The awl is easily made of polished and sandpapered hard wood.

TIN BENDER

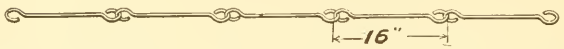
It often becomes necessary for the miller to bend up tin to line spouting. In order to get this tin bent up evenly and uniformly it



will be time saved to make up an arrangement as shown in the drawing. The device is shown at the end only and when one is made it should be about 30 inches long. Leave a crease at *A* where the tin is inserted. *B* shows how the tin is bent.

CHOKE RELIEVER

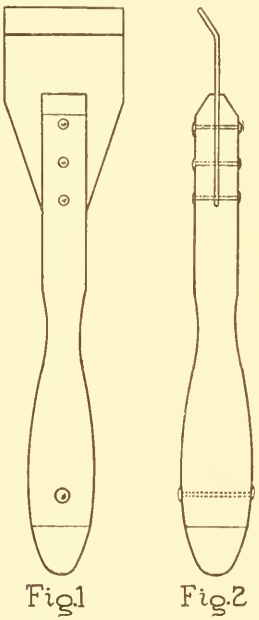
Here is a little device needed on every floor of the mill for relieving chokes. Use pretty stiff galvanized wire cut in pieces about 16



inches long. Bend hooks on each end and make a chain of them; about eight or ten pieces are most convenient. It will go down a spout or up one, easily, and can be folded up when not in use.

RIDDLE CLEANER

Pounding the riddles of a separator with mallet, hammer, or even with the hands, soon destroys their usefulness. A tool made like the drawing may be used with good effect in cleaning them, and will not



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injure them in any way. Cut a piece of heavy sheet iron about 5 inches wide and to conform in shape to the sketch in Fig. 1, and slightly curved at end, as shown in Fig. 2. The handle may be made of a piece of ordinary spout lumber, ⅞x1½ inches and about 2 feet long, with slot cut in one end. In this slot is inserted the piece of cut sheet

iron and it is secured in place by driving two or three small nails through and clinching. The handle may then be shaped to suit the operator.

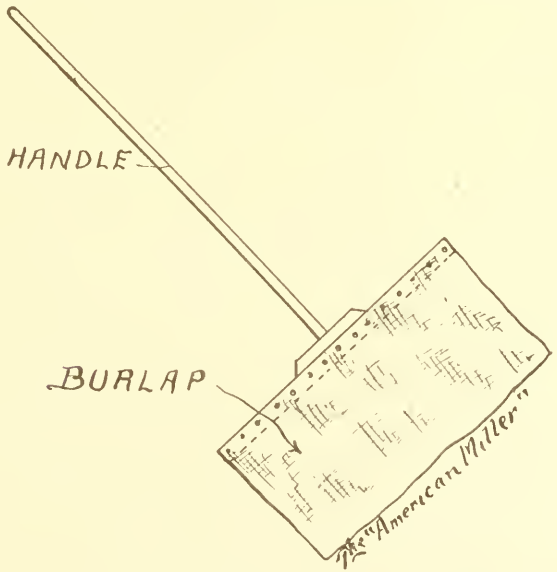
A SPOUT SWAB

In order to keep spouts in good condition, secure a cheap buggy whip or flexible fishing pole. Cut away the small end for a few feet,

bore a hole four or five inches from the small end and cover the end with a muslin flour sack, forming a small bag. Sew the end of the bag to a string and run the string through the eyehole in the pole. This will keep the bag from coming off, and makes a good spout swab.

AIR-SHIP FLOOR CLEANER

The sketch illustrates what is termed the "air-ship" floor cleaner. It will wipe up all of the fine dust remaining on the floor after it has

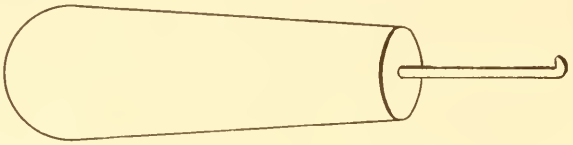


been swept with an ordinary floor brush. To make an air-ship floor cleaner take a piece of wood 1½x2x30 inches long, bore a hole in the center for handle and tack on a burlap bag on the cross piece, as shown.

TOOL FOR STRETCHING BOLTING CLOTH

Everyone knows how difficult it is to stretch bolting cloth properly when putting same on sifter sieves. This little tool has proved satisfactory for stretching the cloth and holding it while tacking.

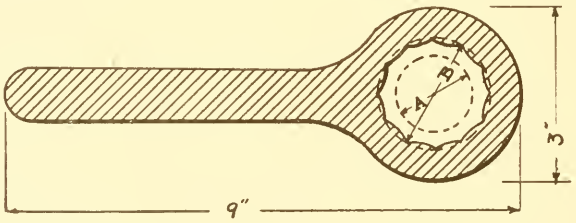
Take a piece of hard wood about the size of a file handle, drive a



six-penny nail about one inch into same, cut the head off and make a small hook on the end and file sharp, as shown in drawing. By sticking hook through web of cloth over sieve frame you can easily stretch it as tightly as desired and your fingers are not in the way when it comes to driving the tacks.

WOODEN WRENCH FOR GREASE CUPS

Especially during cold weather, turning the hand wheels or caps on large grease cups on sifters is often a wrist-straining operation, therefore the following wrench suggestion is offered: By using a ⅞x3-inch piece of elm or any tough hard wood about 9 inches long, a



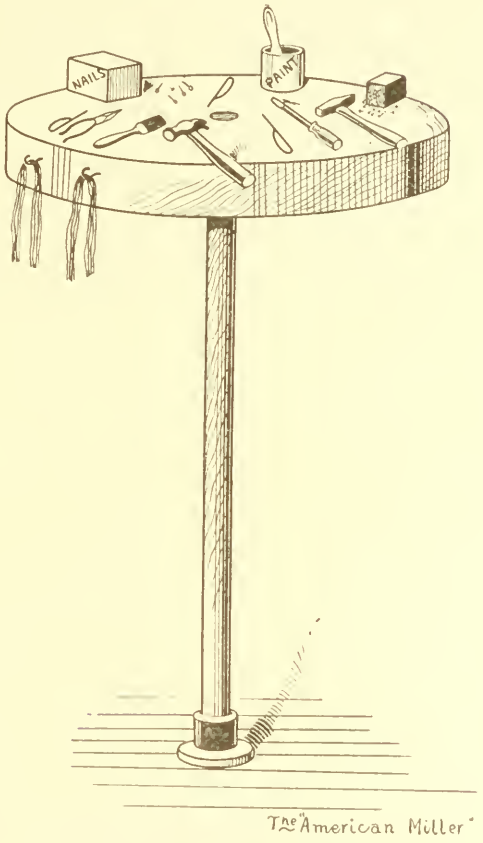
wrench can be shaped up. Describe a circle *B* at one end which has the same diameter as outside points of grease cup; leave sufficient material around edge for strength and shape down to a handle. Now bore a hole the size of circle *A* and cut the inside down by hand to fit the hand wheels, so that a snug fit is made when wrench is slipped on.

MILLER'S TURNTABLE

The steps that can be saved by the device here shown will amount to a long distance in the course of a year. The turntable should be placed near the packer scales and within easy reach. All the supplies

that are needed at that station will thus be on hand and can be picked up without moving from the position in front of the machine.

The table revolves upon an upright rod. The top can be turned

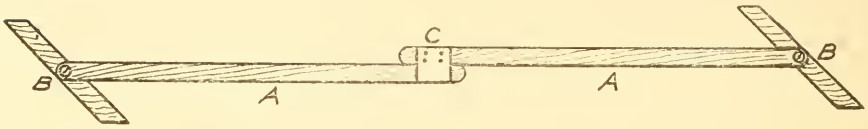


with the hand, and string, needles, pliers, hammer, nails, stencil, everything it contains, is within reach. It takes up far less room than a bench of equal capacity.

DEVICE FOR CUTTING SPOUTS

The following is a simple device to cut spouts any length and angle. The two sliding bars, *A A*, are made from ⅞-inch matched lumber. They have adjustable blades, shown at *BB*, at the two extremities. These blades can be set to fit any level and are held in position by screws which go through the sliding bars as shown. The

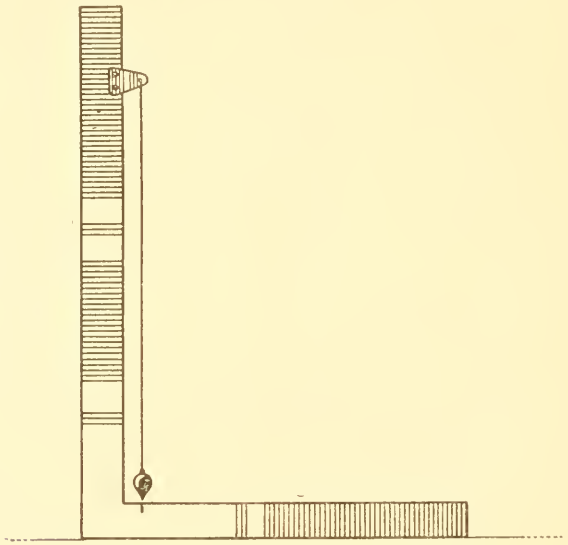
clamp *C* is fastened to one of the bars, the other bar sliding inside it to make the length between the two blades whatever desired. With



this little contrivance any man who can use a handsaw can make a perfectly fitting spout.

USING STEEL SQUARE AS A LEVEL

This sketch shows how to make a combination level and square out of a steel square. When the plumb bob, suspended as shown,



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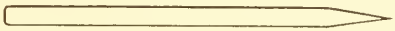
points to the mark indicated, the surface is level, or the upright is plumb. This device will be found to be very sensitive, even more sensitive than the regular bubble level, and will be a great convenience.

REPAIRING SMALL HOLES IN BOLTING CLOTH

Bolting cloth on sifters and reels that is somewhat worn is likely to contain a number of very small holes. The best method for repairing such a cloth is to use a small pointed stick of hardwood, as indi-

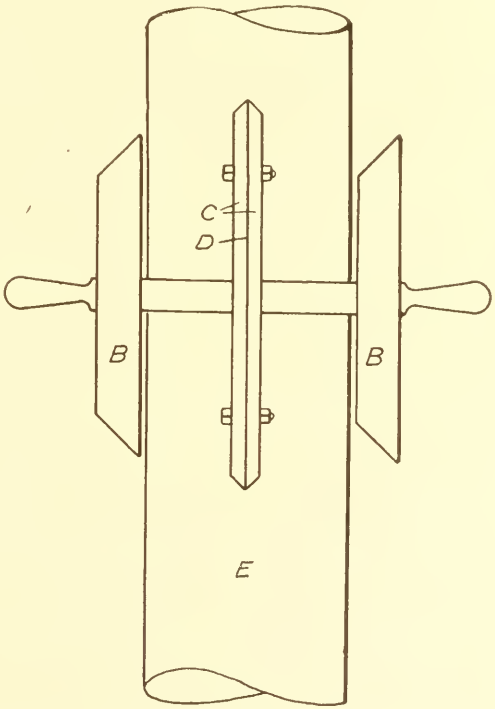
cated herewith, dipping the point in the glue and applying it to the hole. It is not necessary to use a patch at all with these small holes. Just



warm the glue slightly, apply sparingly, and then cover the place with flour dust. In this way the capacity of the cloth will not be decreased. The stick should be of very hard wood, so that the point will not become ragged after being wet.

SIMPLE KEY-WAY CUTTER

This is a simple and inexpensive key-seat cutter which any miller can make. The cutter itself is made by placing a 10-inch hack-saw, *D*, between two strips of wood, *C*, and fastening tightly with screws.



BB are guide-boards extending on either side of *E*, the shaft to be cut. With this simple arrangement a key way of any size and depth can be cut cleanly and perfectly. It is an easy matter to adjust the guide.

ADJUSTABLE CENTER FOR ALIGNMENT

This adjustable center is made of three pieces of wood, Fig. 1 showing the front and Fig. 2 the side view. Those pieces can be made any size desired. For ordinary use make them between 6 inches and 12 inches in length. *A* is the base, the piece *B* sliding back and forth in a groove, and *C* works in a corresponding groove cut on *B*. These grooves or notches must be cut so there will be a good and fairly

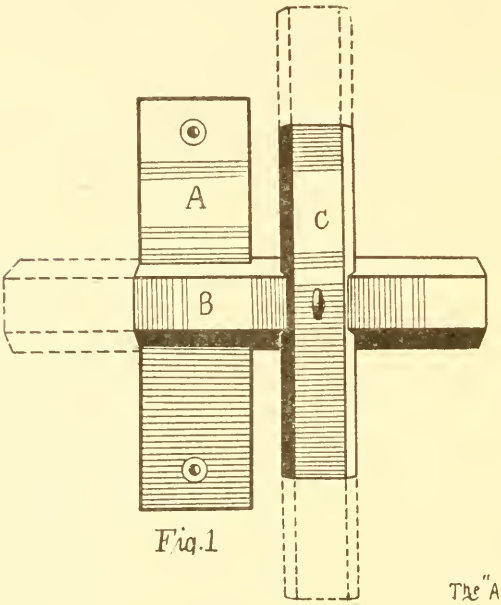


Fig. 1

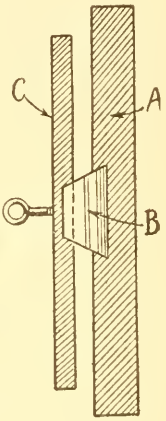


Fig. 2

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tight fit. It is almost unnecessary to point out that the grooves must also be square with the pieces, that is, *B* must be absolutely perpendicular to *A* and *B* perpendicular to *C*. The two pieces *C* and *A* will then be exactly parallel. The dotted portions shown in Fig. 1 are merely to indicate how the respective pieces will slide and occupy new positions as desired.

The large piece *A* has two holes, one on each end. These are for the purpose of fastening it to the wall, or a plank, or a stub in the ground if there is no building to start with. Take four of these adjustable centers, to line up an engine both ways, or two to align a common line shaft.

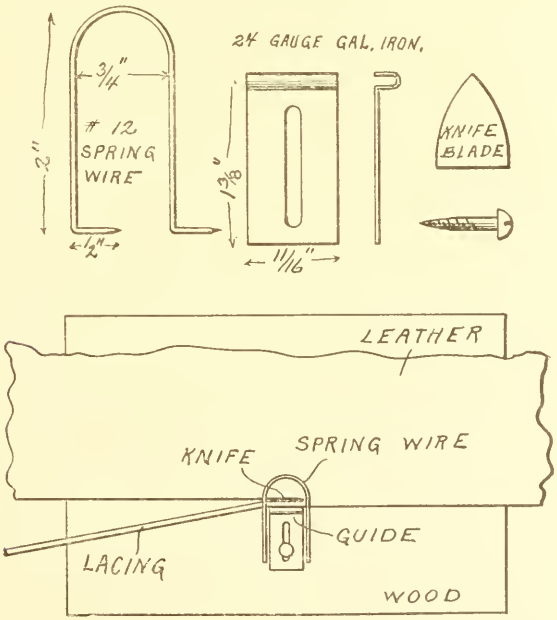
In lining up a shaft, for instance, first get the shaft up some-

where close to its permanent position, fasten the two adjustable centers up and then stretch a string to the eyebolt as shown in *C*. After the line is drawn tight, the centers can be moved up and down or back and forth until the string has come in exact line with where the shaft should be. A light tap will move the pieces of the adjustable center in the direction desired and with the line stretched tight the pieces will stay put. Then set the boxes up to the line.

If the shaft is already in the hangers and it is desired merely to re-align it, stretch the line to the adjustable centers above or below the shaft; then take a rule and get the exact measure on every bearing and the shaft will be in line.

DEVICE FOR CUTTING LACE LEATHER

Here are the component parts and the method of operation of a handy little device for cutting lace leather. The drawing will explain



itself and nothing need be added except possibly that it should be attached to a large board or to the work bench itself, so that the miller will know where to find it when he wants it in a hurry.

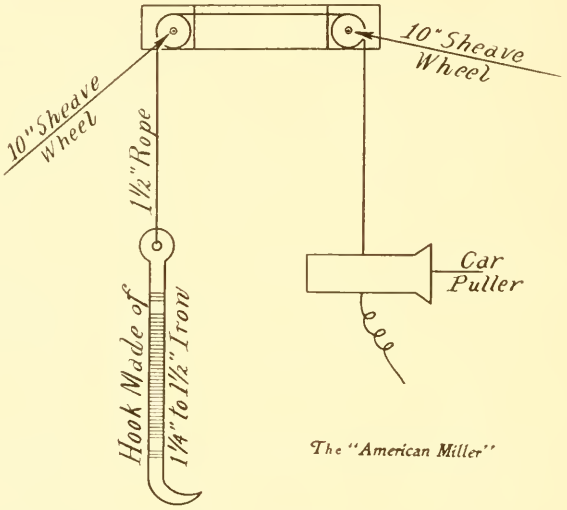
CHAPTER XV

MISCELLANEOUS

GETTING OUT CAR GRAIN DOORS

Where the mill has a power car puller the following method for getting out grain doors is most efficient:

Drive a hook into the grain door, wrap the other end of rope two or three times around the capstan of the car puller, start the car puller, and the door comes out intact. This saves an average of 20 minutes'



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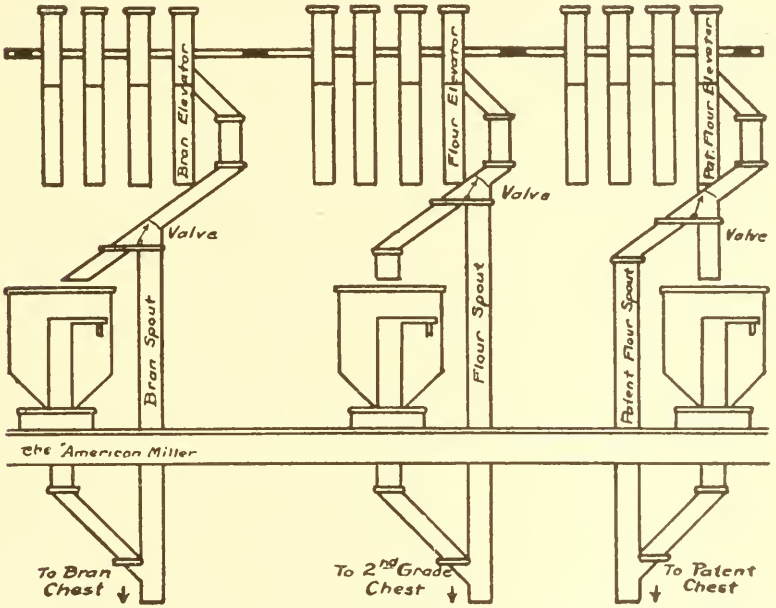
time per car for two men at 20 cents per hour each. With unloading capacity of 15 or 20 cars daylight work, the actual saving will amount to $600 to $700 annually.

This door lifter consists of a hook made of iron 1¼ to 1½ inches square (any old piece of iron or shaft will do), with an eye large enough to admit a 1½-inch rope. A timber made of four pieces of 2x12-inch, well bolted together, with the two inside pieces enough shorter than the others to admit a 10-inch sheave wheel at each end. The length of this timber will depend on distance of car puller from the car. The outside end should extend out to and over the door of car, and high enough to not interfere with work of railroad men.

YIELD TAKING IN SMALL MILLS

The accompanying sketch illustrates a quick and inexpensive method for ascertaining the exact yield of flour and feed from a running stream in a flouring mill.

If making one grade of feed and two grades of flour, which is the custom in most mills, secure three small common platform scales each having a capacity equal to the amount of flour and bran the mill



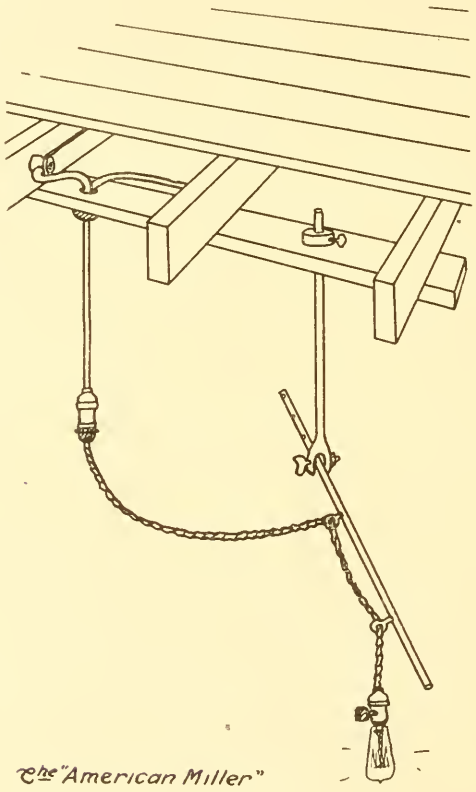
will produce in a given time, say 30 minutes. Make galvanized hoppers to set on these scales of suitable size to hold their respective contents for the length of the test, allowing one cubic foot of hopper to every 32 pounds of loose flour and one to every 20 pounds of loose bran, with the valved discharge of each hopper cut through the wooden platform of its scale and extending by a flexible connection to the packer chest. Next put valves in the two flour spouts and bran spout above the scales, with stub spouts from each valve into the tops of each galvanized hopper.

If the mill is so built that the three valves are as close together as shown in the diagram, they may be connected by rope or wooden rod, so as to be opened and closed simultaneously. If widely apart, how-

ever, they can be operated by hand without affecting the results, provided they are closed in the same order as they are opened, duplicating the time consumed in the two operations in going from one valve to another. When scales, hoppers, valves and spouts are installed substantially as the drawing shows, any authorized person like the miller, owner or manager can take a yield from a running stream that will indicate the exact yield.

ADJUSTABLE LAMP

The extension lamp holder shown herewith permits of a wide range of adjustment. To the floor joists is nailed a ⅞-inch strip

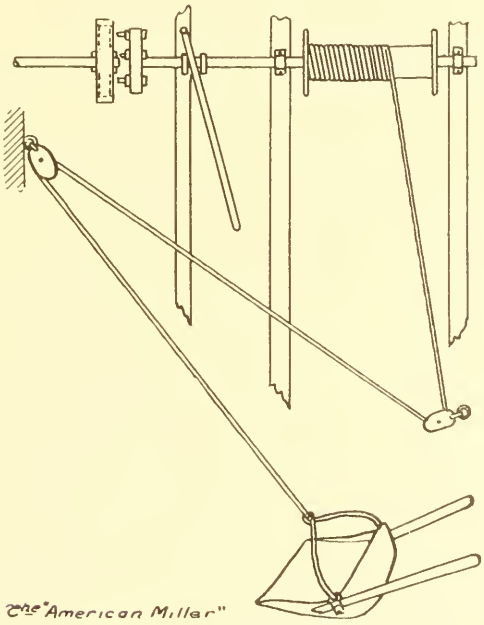


about 4 inches wide. Through this a hole is bored to permit a round pendant to revolve easily in it. A collar secures the pendant from falling and also allows it to be revolved easily in any direction. The

length of the pendant will of course depend on the height of the ceiling. At the pendant's lower end is a slot and clamping screw with winged nut holding the movable arm with eyelets and extension cord and lamp.

POWER SCOOP

This scoop will move more grain in the same time than 10 men will shovel. The clutch is made of two old sprocket wheels, one of them a solid cast iron wheel, the other with spokes. In the solid wheel three or four holes are bored and ⅝-inch bolts fastened in with a nut



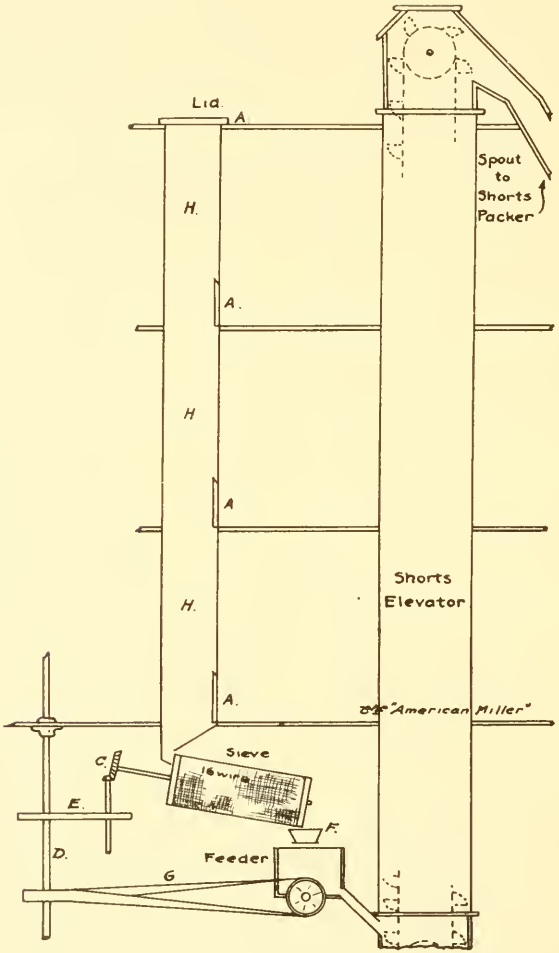
and bolt, extend through far enough for them to be caught by the spokes of the other wheel if the two are brought together. This novel clutch is operated by one man while the other man operates the scoop. The clutching part slides in its bearing enough to make engagement with the shaft wheel and disengage its teeth therefrom.

The drum should turn fast enough to pull the rope at a rate of from 100 to 150 feet per minute. The scoop is 26 inches wide and about 28 inches long. By introducing block and fall in convenient

places, one can move the grain from practically any place in the mill, in any direction. Bins that are not hoppered are readily and quickly scooped. Cars may be unloaded or loaded and filling the ends of the cars is an easy matter.

HANDLING SWEEPINGS

The accompanying sketch illustrates a very handy way of taking



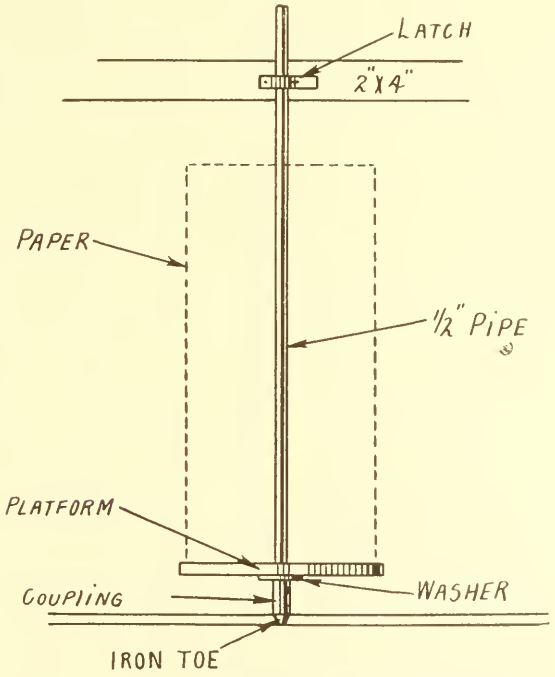
care of sweepings every day so as not let them gather around the mill in corners piled up in sacks.

As indicated, *A* is lid in spout *H*, leading from top floor to base-

ment. *B* is counter shaft, driven from roller shaft *D*. *C* is an eccentric on counter shaft to shake sieve below spout *H*. Place sieve right under the ceiling in basement. *E* is a belt drive from shaft *D* to counter shaft *B*.. Place the shorts feeder under sieve. *G* is the drive from shaft *D* to shorts feeder, spout feeder to shorts elevator. Have the sweeper dump sweepings in spout *H* through bin A on each floor and one will never see sweepings gathering around the mill.

DEVICE FOR CAR LINERS

Most mills which ship flour in sacks, paper or cotton, line the car with paper to keep the sacks in good condition. The accompany-



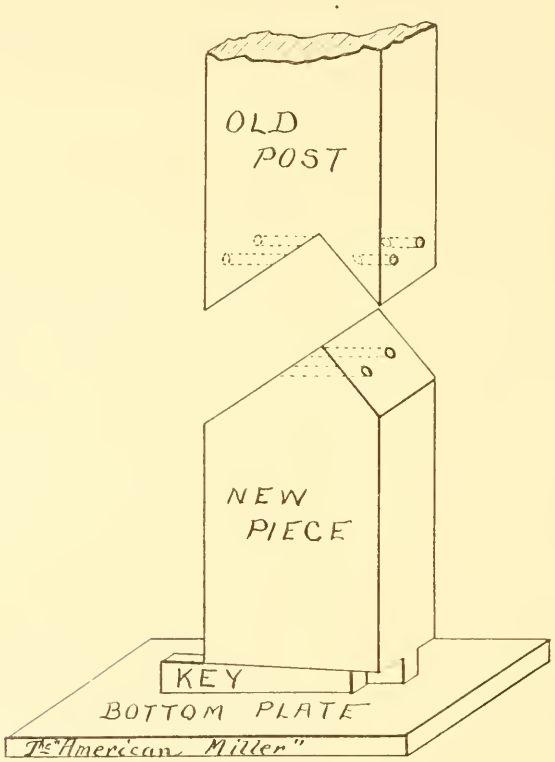
The "American Miller"

ing device is very handy, not only in placing the paper roll, but also in keeping it out of the way when not in use, as it can be set in a corner. Take a piece of ½-inch gas pipe and screw a coupling on one end, against which is placed a large iron washer. Then make a wooden platform for the paper to stand on. Screw an iron toe into the

coupling and a step in the floor. It is an easy matter to slip the rod through the paper roll, up-end it and let the rod to into a notch in a 2x4, with a latch to fasten it in place.

SPLICING A POST

The following is a very efficient way of splicing a post that has rotted on the end, while the greater part of the post is in a good state



of preservation, and in a place where it may be difficult to remove the whole post to put in a new one.

The angle of the cuts should be great enough to allow two bolts to be run through the splice. First hang the post securely by braces, then cut the bottom, as shown in sketch, above the rotten place, then bolt the new piece on, and drive the key back so as to allow the tenon to extend through the bottom plate in order to cast a way for it in

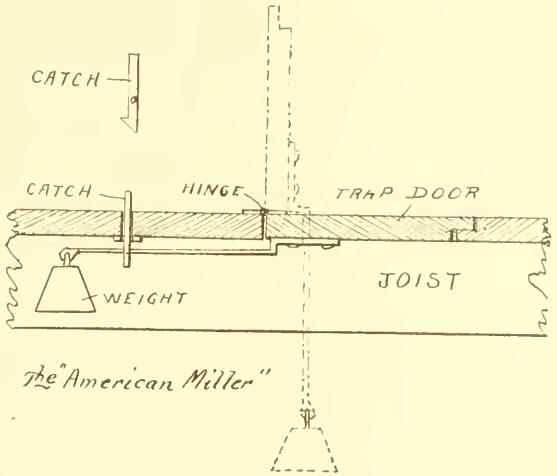
the concrete footing. Fasten the plate accordingly with small nails and also tack the two keys in tightly after all has been plumbed and leveled.

Next build a form around the plate and fill with concrete mixed to proportion of two parts cement to one part of clean sand for heavy posts, or for lighter posts three or four to one.

Where posts have been put up in damp cellars it is sometimes found that the shafting is hard to keep in line, and if examined closely this weakness around the keys and plate is often found to be the cause, and when mixed with a good concrete footing in the manner described will be found very efficient.

AUTOMATIC TRAP DOOR

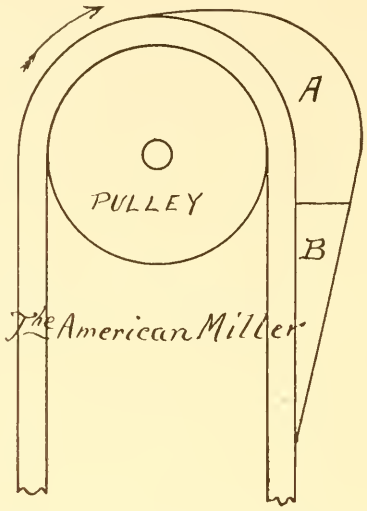
The following trap door can be opened and closed with the foot, and will latch automatically when closed. The catch to the door is



fastened to the under side. It is fastened to a plug which goes through a hole in the floor and projects about half an inch above. When this plug is stepped on it releases the catch, and the door, which is attached by a rope to a weight heavier than itself, opens. It can be closed by pressing down with the foot, and the latch holds it in place until again needed.

ATTACHMENT ON EMPLOYES' ELEVATOR

Almost all of the employes' elevators used in the mills make a fearful clatter when passing over the top. Besides the noise, the jerk-

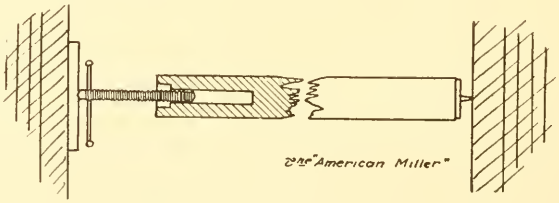


ing of the step as it goes over the top breaks the belt and the step.

To remedy these faults, have two pieces of iron made in the shape of *A* in the drawing. This is to be as wide as the track on which the step runs. At the lower end of *A* put in a block, *B*, to hold *A* solid. This iron must be riveted tightly in place. The noise and jerking will be much less.

BRIDGE FOR CAR DOORS

In loading cars it is nearly always desirable to have a rest or



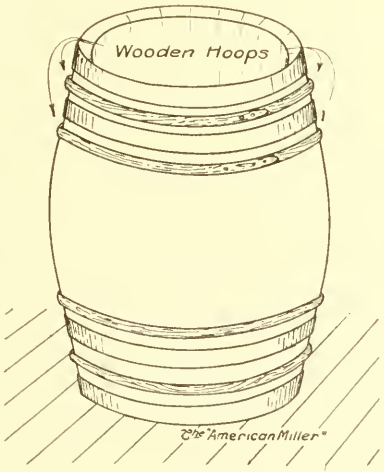
bridge across the door if a spout is being used. Take a 4x4 tough scantling and fasten on one end a plate having a ¾-inch spike extending through from the center. On the other end of the board is placed

a screw-jack arrangement which is made and adjusted in the following manner: Bore a 1-inch hole in the center deep enough into the wood to allow the screw to work freely therein. Centered with the hole, countersink a nut flush with the end of the scantling. Use an ordinary 1-inch bolt, threaded well down to the head, which, for this usage, should have a conical point of about ¾ inch. For a handle to operate the screw, use a double-headed pin, passed through the bolt well up towards the head.

Now the bridge is adjusted to nearly the right width, raised and placed in any desired position on the freight car door and the bolt turned around, clamping the bridge into position. A few turns of the screw and it is removed without damage to the door or destruction of door liners.

SAFETY WATER BARREL

Due to corrosion, the iron hoops which secure a barrel will often break and make the barrel, upon a slight jar, fall to pieces. This corrosion is natural and there is no way to prevent it. To make the

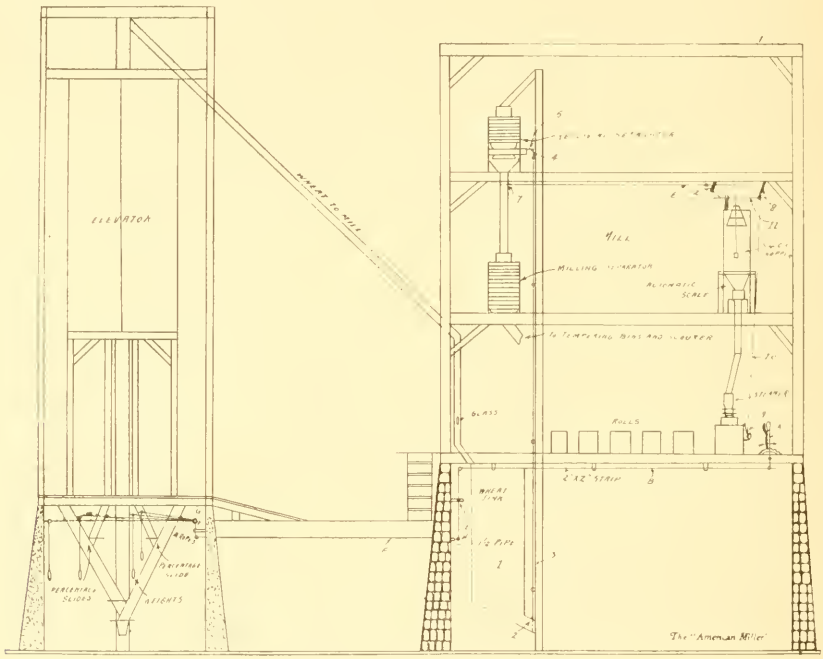


barrel safe and sound and do away with the liability of finding the barrel unsound when it is most needed, wooden hoops in addition to iron ones may be placed around the barrel. These wooden hoops will indefinitely keep the staves in place and prevent the water from leaking all over the mill floor.

AUTOMATIC WHEAT SYSTEM

Quite often it happens that the elevator that the mill draws its wheat from stands apart from the mill proper, while the mill draws wheat at all time when running. In case of a shut down the miller has to run clear over to elevator to shut off the wheat or a large amount of wheat will be spilled over and lots of work required to start the elevator.

The arrangement shown here will save the miller a great many steps and any amount of waste around the mill and elevator. All



of the parts may be picked up around any mill so the only item of expense is a little time on the part of the miller to put in the same.

In the sketch a lever *A* at first break roll goes through the floor and connects with the 2x2-inch wood strip *B*, which goes through basement and operates an arm *C*. This slides rod *E* through pipe *F* to arm *G*. To this arm or lever are attached a number of ¼-inch ropes. These run to the slides in the spouts that wheat is drawn from and are placed above the percentage slides. In opposite end of slides is attached a similar rope which runs over a pulley placed on same

level as slide. To the end of this rope is attached a weight large enough to replace slide when lever *A* releases the ropes on other end of slide. In shutting down or starting up all that is necessary to obtain wheat from elevator or to shut it off is to shove lever *A* forward or back.

Now the wheat is in the mill. The sketch shows wheat sink, *1*, spout *2*, slide *3* which runs up to the receiving separator on top floor. This separator has a hopper under it which holds six or eight bushels of wheat. A pair of wings are placed in this hopper so the wheat falls directly on them as the wheat fills up and covers wings. The weight and downward movement of the wings causes them to spread downward and out causing lever *4* with which the wings are connected to push down slide *3* till the wheat flows out of sink *1* in stream large enough to hold the hopper of wheat under separator at an even level. Spring *5* is a coil spring like those put on screen doors which steadies and regulates the flow of wheat by holding wings up till weight of wheat pushes them down.

Now over rolls and stock hopper place another set of wings and connect them to lever *11*, which in turn operates arm *12*. This causes rod *6* to operate slide *7* over milling separator. As the wheat fills up on the wings in stock hopper the weight will slowly shut off feed on milling separator. As the wheat backs up to receiving separator, the wings in the hopper there will regulate wheat coming to wheat separator thereby saving an overload on separator.

The level in wheat in stock hopper is regulated by the tension spring *8*. When shutting down mill shut off elevator by lever *A*, then pull lever *9* down and hook it. All wheat will cease to move till lever *9* is again released. A wire *10* is run from lever *9* to lever *11* above wings.

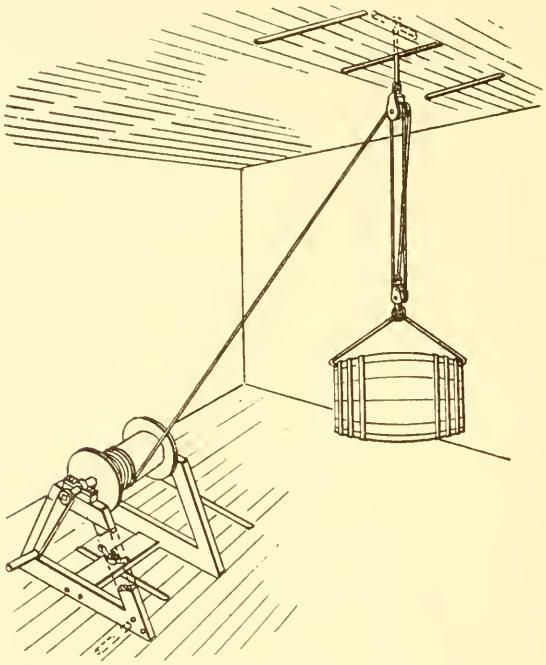
Now by placing wings in tempering bin at the top and connecting with a slide in discharge spout your wheat in tempering bin will stay at an even level at all times regardless of the amount of wheat being ground. By having another lever at first break roll connecting with a slide under tempering bin, one does not have to leave first break rolls to shut down the mill.

Another good feature of the arrangement is that should a stone or any foreign matter lodge against feed slides when the level of wheat gets below normal, the wings will open slides wide until the wheat again reaches normal level. This will allow the foreign matter to pass through under the slide and a choke-up on wheat is avoided.

HOME-MADE BARREL HOIST

The following wrinkle shows a good method of barrel lifting. Make a windlass, building a frame out of 2½x2½-inch timber and put together with bolts. Then fit an old shaft into this frame, with iron flanges inside the boxing at each end. The ends of the shaft are squared by the blacksmith and cranks fitted on.

Then hang a double rope pulley to the ceiling, the latter having slots at various points. A long, large link is then attached to the



rope pulley, extending through the floor above, and a large bolt is laid across the floor above and put through the link. A single-rope pulley is used at the bottom in the usual way.

The floor below also should have slots at various places and put a tee through the slot and turn to right angles. The frame has a crosspiece at the bottom and the tee enters this crosspiece, with a little crank threaded and turned on the top end of the tee. This will hold the frame in place. The barrels are grabbed by the two irons, as shown in the accompanying cut. The rope can be attached to the windlass by a hook fastened to one of the flanges with thread and nut.

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